CONTROL DATA

60000420

CYBER Initialization Package (CIP)

REFERENCE

CYBER 960, 970, 994

Computer Systems

CYBER Initialization Package (CIP); CYBER 960, 970, 994 Computer Systems

Reference Manual

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features and parameters.

Publication Number 60000420

Manual History

Technical changes and additions are indicated by vertical change bars in the margins.

Revision	System Version	CIP Level	Date
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B	NOS/VE 1.5.2	V11 L750	June 1990
C	NOS/VE 1.5.3	L765	January 1991
D	NOS/VE 1.6.1	L780	August 1991
E	NOS/VE 1.6.1	L780C	March 1992

Revision E of this manual incorporates miscellaneous updates at CIP level 780C and adds support for the CYBER 970 computer system.

Revision letters I, O, Q, S, X, and Z are not used.

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About This Manual

This manual includes information on how to install and use the CONTROL DATA® CYBER Initialization Package (CIP) on CDC® CYBER 960, 970, and 994 computer systems.

Organization

This manual is organized into five chapters and six appendixes.

- Chapter 1 introduces CIP, noting its advantages and implications.
- Chapter 2 provides CIP installation procedures, OS boot installation procedures, and an overview and description of all CIP displays.
- Chapter 3 provides general and OS deadstart procedures.
- Chapter 4 provides general CIP procedures such as performing an extended deadstart dump (EDD) and performing a power-on initialization.
- Chapter 5 provides reference information for the monitor display driver (MDD).
- The appendixes include a glossary of CIP-related terms, a directory of error messages, field change announcement (FCA) information oriented toward the customer engineer (CE), instructions for reporting a CIP-related problem, and a directory of HIVS tests.

Audience

This manual is directed to CEs, operators, and site analysts who are responsible for installing and maintaining CIP on CDC CYBER 960, 970, and 994 computer systems.[1]

Disclaimer

This product is intended for use only as described in this document. Control Data cannot be repsponsible for the proper functioning of undescribed features or parameters.

1. This manual is also used by the CYBER Software Support and CYBER Hardware Support organizations.

Conventions

The following conventions are used in this manual:

- When the word "press" is used in an instruction, it tells you to press the named key or keys. For example, when you see the instruction:

  Press **Enter**

  you should press the key labeled **Enter** on your CC598-B/E console keyboard.

  (Although the space bar is not labeled, bold face is used to name that key also, for example: press **Space Bar**.)

- When the word "press" precedes a string of keys that are separated by hyphens, it means that you should simultaneously press the keys separated by hyphens. For example, when you see the instruction:

  Press **Ctrl-F2**

  you should simultaneously press the keys marked **Ctrl** and **F2** on your CC598-B/E console keyboard.

- When the word "type" is used in an instruction, it tells you to type in the following word. For example, when you see the instruction:

  Type TEST

  you should type the letters T E S T in sequence.

- Pressing **Ctrl-Alt-Del** or applying power to the CC598-B/E is called console initialization.

- Pressing **Ctrl-F2** will bring up the CONSOLE MAIN MENU display.

NOTE

A deadstart is executed only after a deadstart option has been selected from a console deadstart display. Pressing **Ctrl-F2** or **Ctrl-Alt-Del** does not execute a deadstart of a CYBER 960, 970, or 994 computer system.

Usage of Terminology, CIP Device

The CIP device is the disk unit within your computing environment, which serves as the storage device for all CIP components. Disk space requirements for installation of CIP is addressed in the first section of this manual.

Assumptions, CIP Procedures

This manual assumes that power is applied on all required equipment, and that the equipment is functioning properly. If at any time the system loses power or the equipment fails, consult the site analyst or CE.

Related Publications

Procedures and descriptions within this manual may refer you to information in the following related Control Data publications.

Control Data Publication	Publication Number
NOS Version 2 Administration Handbook	60459840
NOS Version 2 Analysis Handbook	60459300
NOS Version 2 Installation Handbook	60459320
NOS Version 2 Operations Handbook	60459310
NOS/BE Installation Handbook	60494300
NOS/BE Operator's Guide	60493900
NOS/BE System Programmer's Reference Manual, Volume 1	60494100
NOS/VE Operations	60463914
NOS/VE Installation and Upgrade	60463913
MSL 15X Off-Line Maintenance Software Library Reference Manual	60456530
MSL 153/155 IOU Test Procedures	60461110
MSL 153/155 IOU Test Descriptions	60461920
721-21/31 Owner's Manual	62950101
19003 System Console (CC598-A/B/D/E) Operations and Maintenance	60463610
698 CYBER Magnetic Tape Subsystem (CMTS) User's Guide	60000009

Submitting Comments

There is a comment sheet at the back of this manual. You can use it to give us your opinion of the manual's usability, to suggest specific improvements, and to report errors. Mail your comments to:

Control Data
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4201 Lexington Avenue N.
St. Paul, MN 55126-6198

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Introduction 1

CYBER Initialization Package (CIP) provides utilities for installing and updating the following hardware/software interface modules.

- Common Test and Initialization (CTI)
- Environment Interface (EI)
- Express Deadstart Dump (EDD)
- Hardware Initialization and Verification Software (HIVS)[1]/Maintenance Software Library (MSL)
- Microcode
- Monitor Display Driver (MDD)
- System Console Driver (SCD)
- Dedicated Fault Tolerance (DFT)
- OS Boot Environment Programs
- System Console Interface (SCI)

CIP also conveniently combines these modules onto a single tape for CYBER 960, 970, and 994 computer systems.

CIP Features

CIP is installed on the CIP device within your computing environment. Installation of CIP can be performed either in initialize or update mode. Initialize mode initializes the CIP device and installs CIP, preserving no other information. Update mode installs CIP to the CIP device and preserves operating system information on the disk, including permanent files.

1. CYBER 994 only.

CIP Release and Distribution

CIP is released whenever it is affected by a change (either a new feature or a correction). A CIP release may be scheduled to occur simultaneously with a software release (NOS, NOS/BE, or NOS/VE). A critical problem that must be fixed between planned releases will cause a CIP Batch Corrective Update (BCU) release.

CIP is released on SCOPE Internal (SI) format magnetic tape [recorded in phase-encoded (PE) mode] and is distributed with the operating system to CDC® computer system sites.

Upon receipt of a new CIP release, the customer should inform the CE that CIP has been received. If the CE recommmends installation of CIP [based on the Field Change Announcement (FCA) data distributed with the release], the installation should be a joint effort between the customer and the CE. The actual installation requires approximately 10 to 20 minutes of dedicated machine time.

Disk Space Requirements

CIP must be installed onto disk (specifically, onto the CIP device). When CIP is installed, disk space is reserved automatically for all CIP components. Table 1-1 shows disk space requirements for CYBER mainframes.

Table 1-1. Disk Space Requirements for CYBER Mainframes

Disk	Disk Space Requirement
844-4X	14.0%
885	4.8%
895	8.2%

Tailored CIP

The CIP tape is tailored for each individual computer system. For example, a 960 CIP tape contains microcode and an MSL unique to the CYBER 960 computer system.

CIP Device Access by the Host

When running NOS/VE in dual state, the CIP device must be accessible by NOS or NOS/BE. Since the CIP device must be accessible to NOS or NOS/BE, it cannot reside on an exclusive NOS/VE channel.

NOTE

You must install CIP onto your CIP device before you can deadstart the OS. The OS load file, however, may reside either on disk or tape (the OS deadstart tape).

Sites Without a Maintenance Contract

CYBER computer systems installed at sites without a maintenance contract will receive a specialized CIP tape. To order a new release of CIP thereafter, the marketing representative must send LDS Data Form #AA5570 to:

Control Data
Software Manufacturing and Distribution, ARH230
4201 N. Lexington
Arden Hills, MN 55126-9983

Be sure to specify the mainframe type.

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CIP Installation Procedures, Deadstart Displays, and Deadstart Options 2

This section includes CIP automatic installation procedures, OS boot program installation procedures, and descriptions of CIP displays and options available to users of CYBER 960, 970, and 994 computer systems.

For Better Performance

You may find it beneficial to remove the overview of displays (figures 2-1, 2-2, 2-20, and 2-21) from their binder and follow along with them as you execute the deadstart procedures within this section. This will help familiarize you with the progression and flow of deadstart displays.

De-Installing CIP

NOTE

This procedure is provided only for Control Data customers who are terminating their maintenance contract with CDC.

When terminating a maintenance contract with Control Data, the customer's MSL version of CIP must be replaced with a non-MSL version. Perform the following steps to install a non-MSL version of CIP on the CIP device.

___ 1. Procure a CIP tape that does not contain MSL.

___ 2. Execute an UPDATE installation of CIP to replace the existing (MSL) version of CIP with a non-MSL version. Refer to CIP installation procedures on the following pages.

Although maintenance will no longer be available, all operating system information residing on the CIP device (including permanent files) will be preserved.

Installing CIP

Although CIP is installed onto the CIP device in such a manner that operating system information can also reside on the disk, the CIP device *must not* be shared by any other mainframe. Select a disk unit within your configuration to serve as the CIP device.

The CIP installation procedure requires dedicated machine time: at least one tape drive and one disk unit must be available.[1]

___ 1. Mount the CIP tape on a tape drive.

NOTE

If a tape mounted on a 698 tape unit does not move or if it fails to rewind after moving forward, refer to the troubleshooting section of the 698 CYBER Magnetic Tape Subsystem (CMTS) User's Guide listed in About This Manual.

___ 2. Complete the following steps to bring up the CONSOLE MAIN MENU on your CC598-B/E.

___ a. Press **Ctrl-F2**.

___ b. The CONSOLE MAIN MENU appears.

If the CONSOLE MAIN MENU does not appear after pressing **Ctrl-F2**:

___ a. Press **Ctrl-Alt-Del**.

___ b. The CDC logo appears. Approximately 10 seconds thereafter, the CONSOLE MAIN MENU appears.

___ 3. If the deadstart program is not set for deadstart from tape:

If your system has a single IOU:

___ a. From the CONSOLE MAIN MENU, type `M` to bring up the MAINTENANCE OPTIONS - IOU0 display.

___ b. Enter or retrieve the deadstart program from CIP tape as described under Warmstart Procedures in section 3.

___ c. From the MAINTENANCE OPTIONS - IOU0 display, type `S` to execute a short deadstart.

___ d. After completion of the short deadstart, the INITIAL OPTIONS display appears. Proceed with step 5.

If your system has a dual IOU:

___ a. From the CONSOLE MAIN MENU, type `M` to bring up the MAINTENANCE OPTIONS menu.

___ b. From the MAINTENANCE OPTIONS menu, type `0` to bring up the MAINTENANCE OPTIONS - IOU0 display.

---

1. CIP installation procedures assume that controlware has been loaded into the peripheral controller(s). If the controlware is not loaded, refer to section 3 of this manual for coldstart instructions.

___ c. Enter or retrieve the deadstart program from CIP tape as described under Warmstart Procedures in section 3.

___ d. From the MAINTENANCE OPTIONS - IOU0 display, type S to execute a short deadstart.

___ e. After completion of the short deadstart, the INITIAL OPTIONS display appears. Proceed with step 5.

___ 4. If the deadstart program is set for deadstart from tape:

___ a. From the CONSOLE MAIN MENU, type S to execute a short deadstart.

___ b. After completion of the short deadstart, the INITIAL OPTIONS display appears.

___ 5. From the INITIAL OPTIONS display, press **Enter** to select the default option; the BUILD DEADSTART DISK display appears.

___ 6. *This step will destroy all information on the CIP device, excluding disk microcode, prior to installing CIP. Before executing this option, be sure you have a backup copy of any information on the CIP device that you wish to preserve (including operating system permanent files and CE command buffers).*

To execute an INITIAL INSTALLATION of CIP, type I while the BUILD DEADSTART DISK is shown.

___ 7. To execute an UPDATE installation of CIP, type U while the BUILD DEADSTART DISK is shown.

The UPDATE option replaces the existing version of CIP on your CIP device while it preserves operating system information on the same device (including permanent files). The UPDATE option replaces CIP in the same mode that was used when the CIP device was initialized.

The CIP modules replaced during an update are:

CTI (Common Test and Initialization)
EDD (Express Deadstart Dump)
EI (Environmental Interface)
MSL (Maintenance Software Library) (includes command buffers)
Microcode (Peripheral and Mainframe)
MDD (Monitor Display Driver)
SCD (System Console Driver)
DFT (Dedicated Fault Tolerance)
SCI (System Console Interface)[2]

2. This module is replaced only if the OS boot programs are not installed in the system.

Information saved during an update includes:

DEL (Deadstart Error Log)
DPB (Default Parameter Block)
Operating system pointers and system files
NOS, NOS/BE, and NOS/VE system file pointers
MRT (Mainframe Reconfiguration Table)
CFT (Central Memory Flaw Table)

___ 8. Enter the channel, equipment, and unit number of your CIP device when prompted. Terminate each entry by pressing **Enter**. Press **Enter** without entering a value to select the displayed default value.

For 844 drives, unit number must be in the range 00 through 07. Press **Enter** to accept unit 00, or key in an alternate unit number, then press **Enter**.

For 885 drives, the unit number must be in the range 40 through 57. Key in a valid unit number, then press **Enter**.

For 895 disk drives, 00 is interpreted as su, where s = storage director number, and u = unit number. Press **Enter** to accept storage director 0, unit 0, or key in alternate values, then press **Enter**.

___ 9. CIP installation is complete when the message INSTALLATION COMPLETE appears.

NOTE

Effective with the CIP V10 Level 716 release, installation of CIP components for NOS/VE systems is a process which requires two tapes. Hardware related components must be read from the CIP tape, while current release OS boot programs must be read from the NOS/VE deadstart tape.

Installing OS Boot Programs

OS boot program installation must be performed during a deadstart from the CIP device. The following procedures assumes that you have warmstarted the storage device on which the OS boot programs are to be installed.[3]

___ 1. Mount the NOS/VE deadstart tape.

___ 2. Complete the following steps to bring up the CONSOLE MAIN MENU on your CC598-B/E.

___ a. Press **Ctrl-F2**.

___ b. The CONSOLE MAIN MENU appears.

If the CONSOLE MAIN MENU does not appear after pressing **Ctrl-F2**:

___ a. Press **Ctrl-Alt-Del**.

___ b. The CDC logo appears. Approximately 10 seconds thereafter, the CONSOLE MAIN MENU appears.

___ 3. From the CONSOLE MAIN MENU display, type `S` or press **Enter**; the SYSTEM LOAD OPTIONS warning display appears. From the warning display, press **Enter** to proceed to the INITIAL OPTIONS display.

___ 4. From the INITIAL OPTIONS display, type `U` to bring up the UTILITIES display.

___ 5. From the UTILITIES display, type `V` to select INSTALL OS BOOT PROGRAMS.

___ 6. The system prompts you for the equipment, channel, and unit number of the tape drive used to read the OS boot programs. CTI copies the OS boot programs from tape to the group two area of the Common Disk Area (CDA). If the system cannot identify the tape as an OS deadstart tape, it displays:

```
TAPE ON UNIT nn NOT RECOGNIZED

ENTER (CR) TO CONTINUE
```

If this message appears, press **Enter** and the system allows you to mount the correct tape and/or specify the correct path.

The system automatically installs the OS boot programs onto the appropriate section of the CDA and then sets the "OS Boot Programs Installed" flag in the deadstart sector of the CIP device. After a successful install, the UTILITIES display reappears.

___ 7. Once the OS boot program installation is complete, you can perform an operating system load.

---

3. For warmstarting procedures, refer to section 3.

Deadstart Displays and Options, CIP Device Deadstart

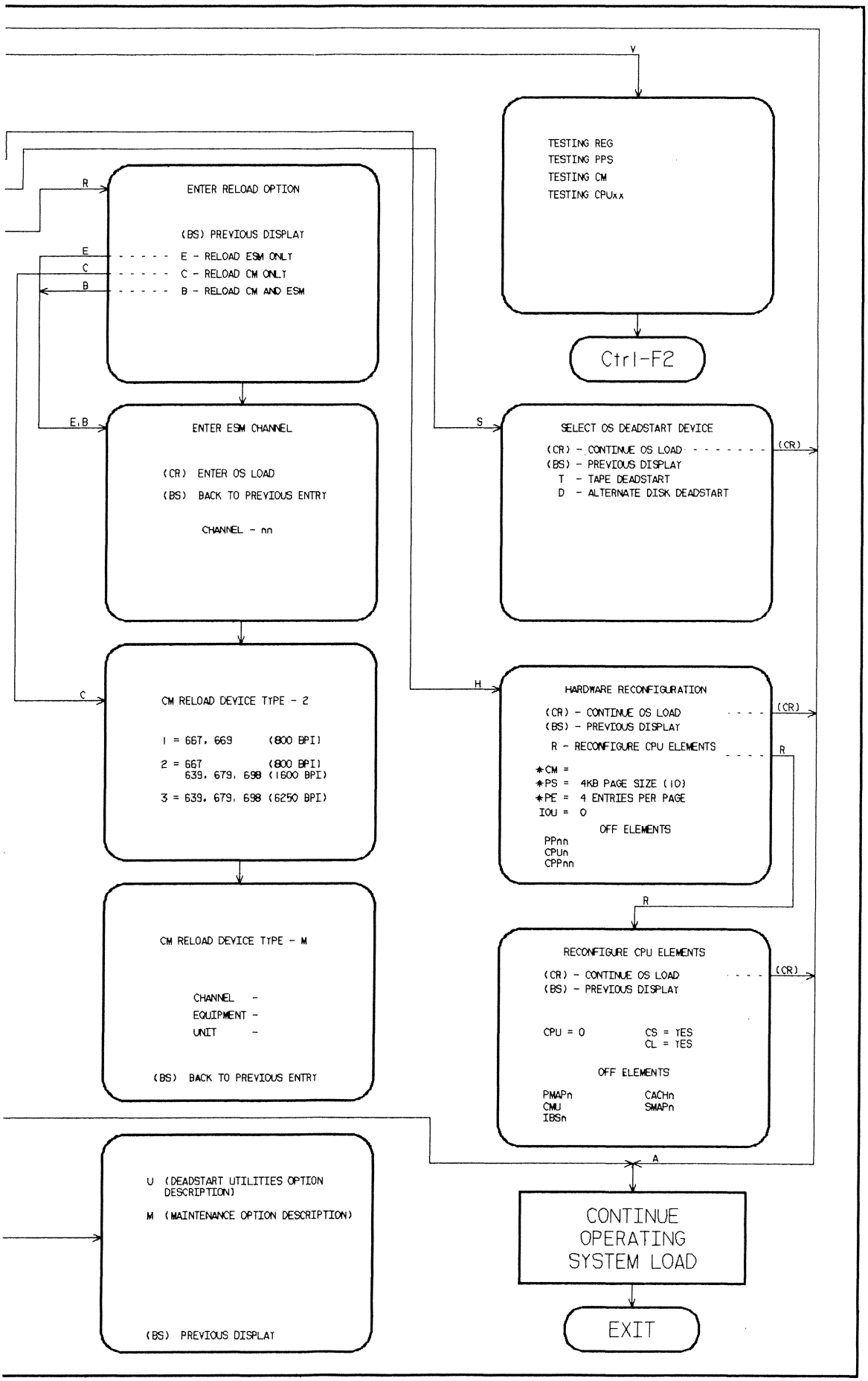
The deadstart from CIP device displays and options included in this section incorporate the following conventions.

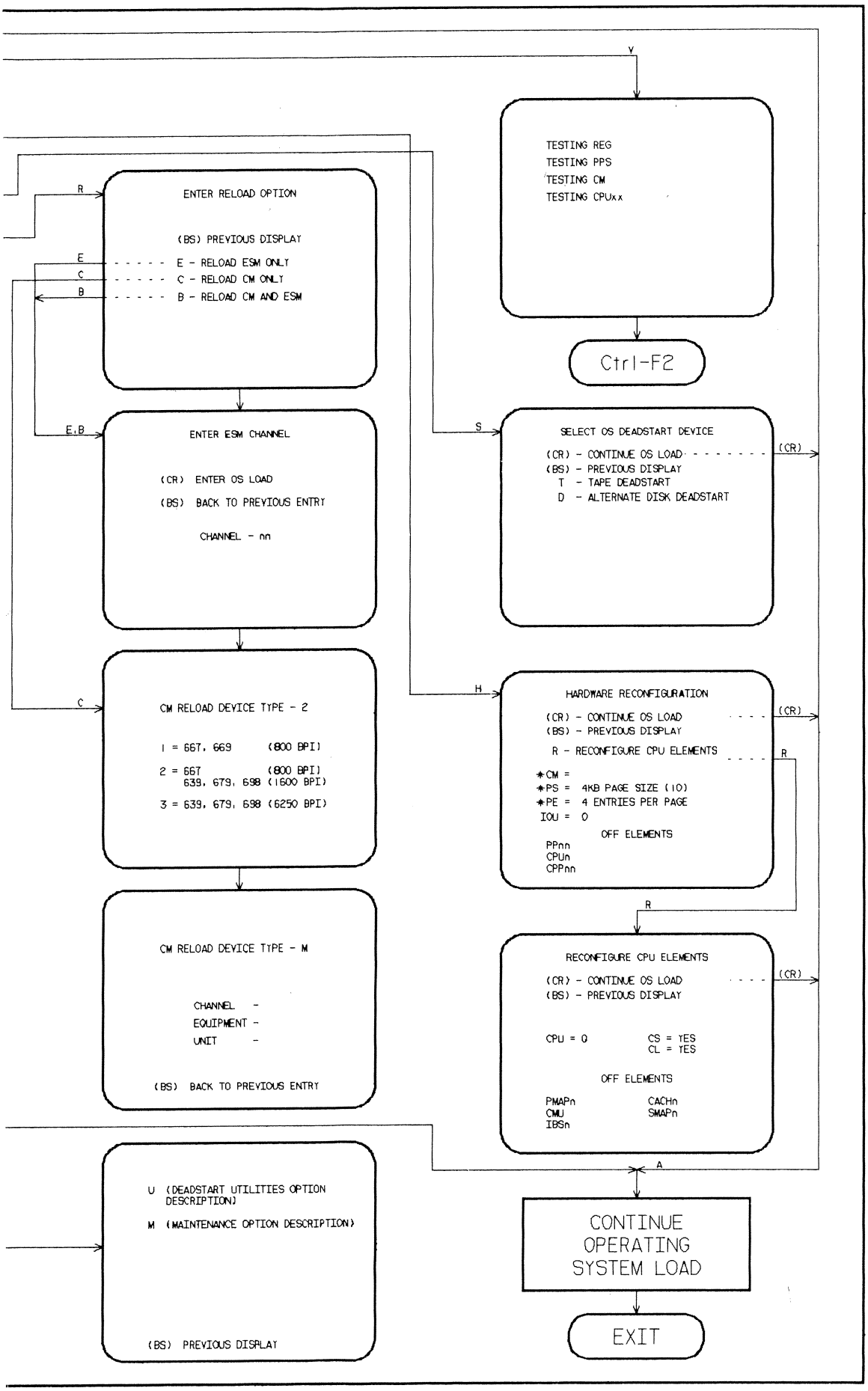
- Pressing **Enter** automatically selects the default option; the first option listed on a menu display is the default option.
- Pressing **Backspace** returns you to the previous display.
- Pressing **Ctrl-F2** returns you to the CONSOLE MAIN MENU display.

Additionally, help information is provided for the INITIAL OPTIONS display; the HELP display supplies abbreviated information about the options.

Overview

Figure 2-1 and 2-2 provide an overview of the displays available during a deadstart from the CIP device for single IOU and dual IOU systems, respectively.


V
TESTING REG
TESTING PPS
TESTING CM
TESTING CPUxx
Ctrl-F2
R
ENTER RELOAD OPTION
(BS) PREVIOUS DISPLAY
E
E - RELOAD ESM ONLY
C
C - RELOAD CM ONLY
B
B - RELOAD CM AND ESM
E,B
ENTER ESM CHANNEL
(CR) ENTER OS LOAD
(BS) BACK TO PREVIOUS ENTRY
CHANNEL - nn
S
SELECT OS DEADSTART DEVICE
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
T - TAPE DEADSTART
D - ALTERNATE DISK DEADSTART
(CR)
C
CM RELOAD DEVICE TYPE - 2
1 = 667, 669 (800 BPI)
2 = 667 (800 BPI)
639, 679, 698 (1600 BPI)
3 = 639, 679, 698 (6250 BPI)
H
HARDWARE RECONFIGURATION
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
R - RECONFIGURE CPU ELEMENTS
(CR)
R
*CM =
*PS = 4KB PAGE SIZE (10)
*PE = 4 ENTRIES PER PAGE
IOU = 0
OFF ELEMENTS
PPnn
CPUn
CPPnn
CM RELOAD DEVICE TYPE - M
CHANNEL -
EQUIPMENT -
UNIT -
(BS) BACK TO PREVIOUS ENTRY
R
RECONFIGURE CPU ELEMENTS
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
(CR)
CPU = 0
CS = YES
CL = YES
OFF ELEMENTS
PMAPn
CMU
IBSn
CACHn
SMAPn
U (DEADSTART UTILITIES OPTION DESCRIPTION)
M (MAINTENANCE OPTION DESCRIPTION)
(BS) PREVIOUS DISPLAY
A
CONTINUE OPERATING SYSTEM LOAD
EXIT


Y
TESTING REG
TESTING PPS
TESTING CM
TESTING CPUxx
Ctrl-F2
R
ENTER RELOAD OPTION
(BS) PREVIOUS DISPLAY
E - - - - - - E - RELOAD ESM ONLY
C - - - - - - C - RELOAD CM ONLY
B - - - - - - B - RELOAD CM AND ESM
E,B
ENTER ESM CHANNEL
(CR) ENTER OS LOAD
(BS) BACK TO PREVIOUS ENTRY
CHANNEL - nn
S
SELECT OS DEADSTART DEVICE
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
T - TAPE DEADSTART
D - ALTERNATE DISK DEADSTART
(CR)
C
CM RELOAD DEVICE TYPE - 2
1 = 667, 669 (800 BPI)
2 = 667 (800 BPI)
639, 679, 698 (1600 BPI)
3 = 639, 679, 698 (6250 BPI)
H
HARDWARE RECONFIGURATION
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
R - RECONFIGURE CPU ELEMENTS
*CM =
*PS = 4KB PAGE SIZE (10)
*PE = 4 ENTRIES PER PAGE
IOU = 0
OFF ELEMENTS
PPnn
CPUn
CPPnn
R
CM RELOAD DEVICE TYPE - M
CHANNEL -
EQUIPMENT -
UNIT -
(BS) BACK TO PREVIOUS ENTRY
RECONFIGURE CPU ELEMENTS
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
CPU = 0
CS = YES
CL = YES
OFF ELEMENTS
PMAPn
CMU
IBSn
CACHn
SMAPn
U (DEADSTART UTILITIES OPTION DESCRIPTION)
M (MAINTENANCE OPTION DESCRIPTION)
(BS) PREVIOUS DISPLAY
A
CONTINUE OPERATING SYSTEM LOAD
EXIT

Console Main Menu, Deadstart From CIP Device

The CONSOLE MAIN MENU (figure 2-3) appears when you:

- Apply power to your CC598-B/E console.
- Press **Ctrl-Alt-Del** on your CC598-B/E console keyboard.
- Press **Ctrl-F2** on your CC598-B/E console keyboard.

After applying power to your console or after pressing **Ctrl-Alt-Del**, the CDC logo appears first; the CONSOLE MAIN MENU appears approximately 10 seconds later. The CONSOLE MAIN MENU appears immediately after pressing **Ctrl-F2**.

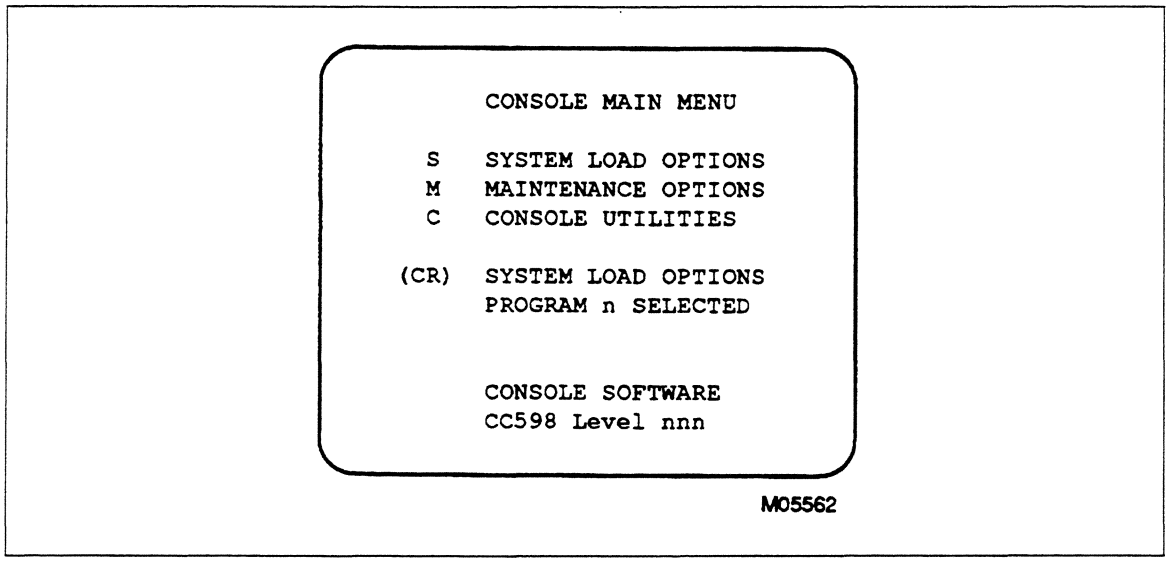


Figure 2-3. Console Main Menu

NOTE

Your console software level, as indicated by `CC598 Level nnn`, may not be the same as your CIP level.

S - SYSTEM LOAD OPTIONS

Select this option from the CONSOLE MAIN MENU to initialize the system. Because current system activity will be terminated by proceeding with this option, the warning display shown in figure 2-4 appears. From the warning display, press **Enter** to proceed with the option or press **Esc** to return to the CONSOLE MAIN MENU. If you press **Enter** to proceed with the option, the system is initialized and the INITIAL OPTIONS display (figure 2-8) appears.

For a description of INITIAL OPTIONS display selections, refer to Initial Options Display, CIP Device Deadstart, later in this section.

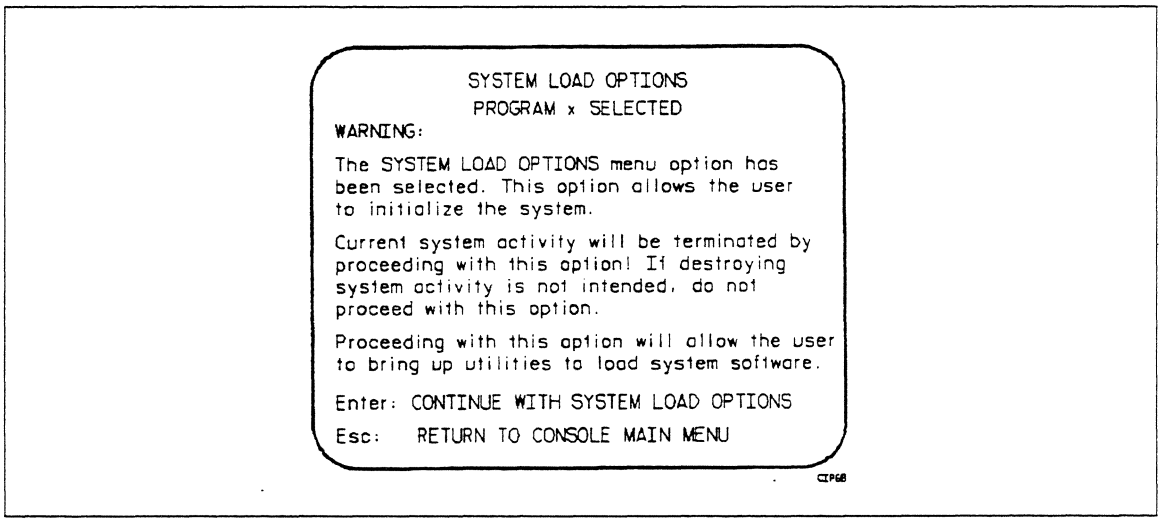

SYSTEM LOAD OPTIONS
PROGRAM x SELECTED
WARNING:
The SYSTEM LOAD OPTIONS menu option has been selected. This option allows the user to initialize the system.
Current system activity will be terminated by proceeding with this option! If destroying system activity is not intended, do not proceed with this option.
Proceeding with this option will allow the user to bring up utilities to load system software.
Enter: CONTINUE WITH SYSTEM LOAD OPTIONS
Esc: RETURN TO CONSOLE MAIN MENU
CIP68

Figure 2-4. System Load Options Warning Display

M - MAINTENANCE OPTIONS

Select this option from the CONSOLE MAIN MENU to bring up the MAINTENANCE OPTIONS - IOU0 display (figure 2-5) on single IOU systems or to bring up the MAINTENANCE OPTIONS menu (figure 2-6) on dual IOU systems.

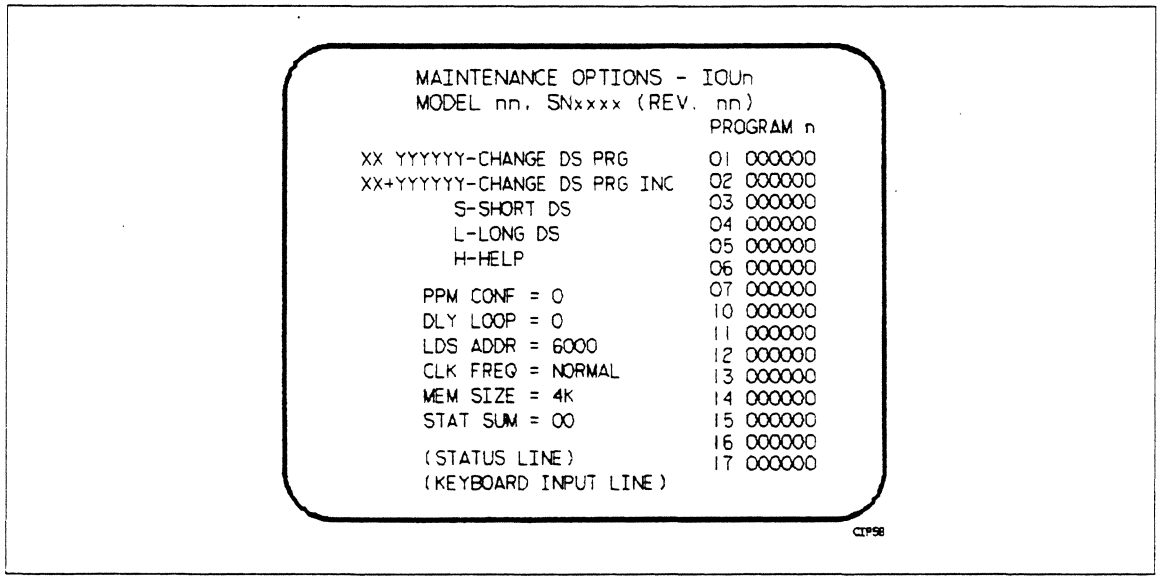


Figure 2-5. Maintenance Options - IOUn Display

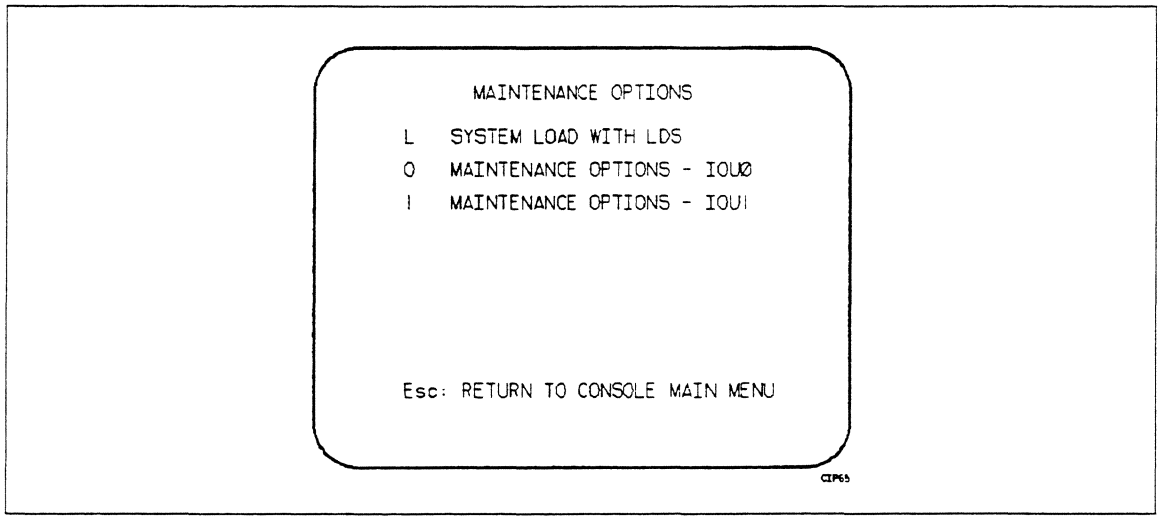

MAINTENANCE OPTIONS
L SYSTEM LOAD WITH LDS
0 MAINTENANCE OPTIONS - IOU0
1 MAINTENANCE OPTIONS - IOU1
Esc: RETURN TO CONSOLE MAIN MENU
CIP65

Figure 2-6. Maintenance Options Menu (Dual IOU Systems Only)

L - SYSTEM LOAD WITH LDS (Dual IOU Systems Only)

Select this option from the MAINTENANCE OPTIONS menu to bring up the dynamic[4] MAINTENANCE OPTION display shown in figure 2-7.

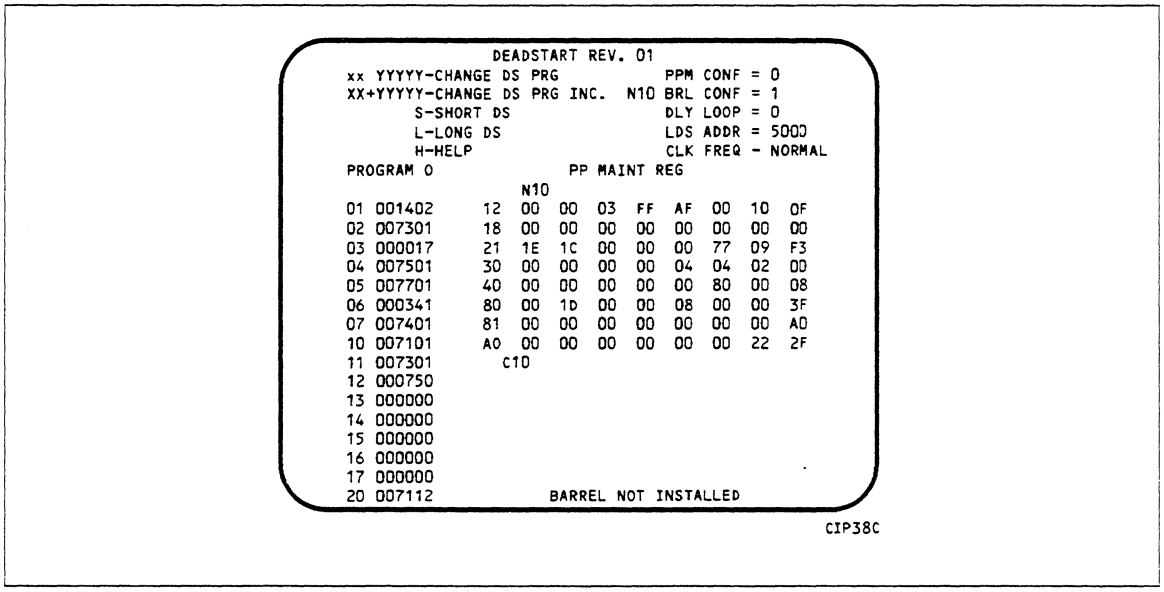


Figure 2-7. Maintenance Options Display (System Load With LDS)

0 - MAINTENANCE OPTIONS - IOU0 (Dual IOU Systems Only)

Select this option from the MAINTENANCE OPTIONS menu (figure 2-6) to bring up the MAINTENANCE OPTIONS - IOU0 display (refer to figure 2-5). For additional information about this option, refer to the MSL 15X Off-Line Reference Manual listed in About This Manual.

1 - MAINTENANCE OPTIONS - IOU1 (Dual IOU Systems Only)

Select this option from the MAINTENANCE OPTIONS menu (figure 2-6) to bring up the MAINTENANCE OPTIONS - IOU1 display (refer to figure 2-5). For additional information about this option, refer to the MSL 15X Off-Line Reference Manual listed in About This Manual.

4. Registers located in the upper right-hand quadrant of this display will change on your console.

Initial Options Display, CIP Device Deadstart

The INITIAL OPTIONS display (figure 2-8) is the first screen to appear after a deadstart is executed. The INITIAL OPTIONS display provides deadstart utilities, operating system load, and execution of off-line maintenance when the deadstart program is set for deadstart from CIP device.

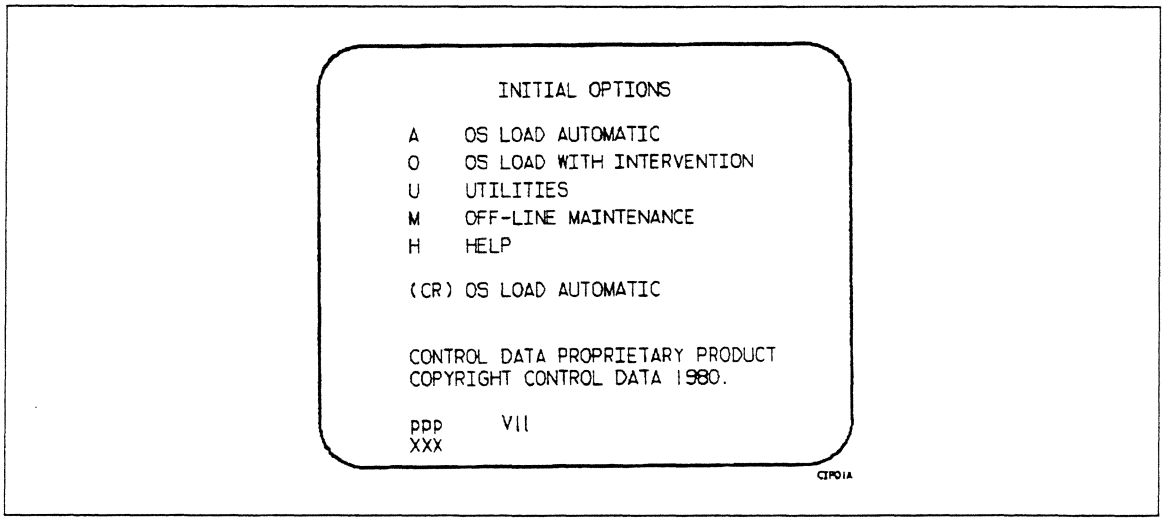


Figure 2-8. Initial Options From CIP Device

The mainframe type (ppp)[5] and the CIP version number (VII) are displayed at the bottom of the INITIAL OPTIONS display. At the very bottom of the display, the PSR level (XXXX) is given.

(CR) or A - OS LOAD AUTOMATIC.

Select this option from the INITIAL OPTIONS display to prompt the system to load modules from the CIP device into memory and the central processor in order to establish the operating environment. Confidence tests, which follow, will then verify the ability of PP memory to hold simple data patterns and the ability to preset PP memory contents to all ones. No operator interaction will be required unless an error occurs.

5. 960, 970, or 994 will appear in place of ppp.

If the system detects a fatal error during confidence testing, CTI records the errors in the DEL (if it is empty) for later processing by the operating system and then automatically attempts to retry the initialization. The following information appears on the left screen, if the DEL is full.

```
ERRORS WERE CLEARED BUT NOT LOGGED
DEADSTART ABORTED - FATAL ERROR

eeee-nn  rrrr     =cc cc cc cc cc cc cc cc
         rrrr     =cc cc cc cc cc cc cc cc
         rrrr     =cc cc cc cc cc cc cc cc
```

Error Display Notation	Description
eeee-nn	Name and logical number of the hardware that has the error. IOU-0n Input/output unit. n=logical number. MEM-00 Central memory. PROC-0n Central processing unit. n=logical number.
rrrr	Register name.
cc	Register content in hexadecimal notation.

The ENTER DATE and ENTER TIME prompts are displayed on the different systems under the following conditions.

The Two Port Mux (TPM) wall clock data is invalid and either 1 or 2 (as follows) is true.

1. NOS/VE load was selected, or
2. The operating system being loaded supports CTI as the primary source of current date and time.

NOTE

The smallest unit of time that can be written to the TPM is minutes. If clock accuracy to within 1 second is desired, you should enter the desired seconds. However, this causes CTI to delay until the start of the next minute before writing the clock and continuing the deadstart.

If clock accuracy to within 1 minute is sufficient, you can enter 00 seconds, and CTI will write the clock without delaying the deadstart. Whenever the time is entered as hh hours, 59 minutes, ss seconds, CTI writes the clock as hh:59:00.

O - OS LOAD WITH INTERVENTION

Select this option from the INITIAL OPTIONS display to bring up the OPERATOR INTERVENTION display (figure 2-9). Refer to Operator Intervention Display, later in this section for a description of the OPERATOR INTERVENTION options.

U - UTILITIES

Select this option from the INITIAL OPTIONS display to bring up the UTILITIES display (figure 2-16). Refer to the Utilities Display, CIP Device Deadstart, later in this section for a description of the UTILITIES options.

M - OFF-LINE MAINTENANCE

Select this option from the INITIAL OPTIONS display to execute hardware tests for preventive maintenance or hardware error diagnosis. For additional information on this option, refer to the MSL 15X Reference Manual listed in About This Manual.

The contents of word 12 of the deadstart program also affect this option. Refer to Setting Word 12 in section 3 of this manual.

NOTE

After executing the OFF-LINE MAINTENANCE option, mainframe initialization is automatically selected, such that proper OS loading may occur.

H - HELP

Select HELP to display a brief description of each INITIAL OPTIONS menu option.

Operator Intervention Display

The OPERATOR INTERVENTION display (figure 2-9) appears after option O has been selected from the INITIAL OPTIONS display (figure 2-8).

CYBER 960/994 Only

```
        OPERATOR INTERVENTION
     LOAD STATE = NOS OR NOS/BE

    A - CONTINUE OS LOAD
  * V - HARDWARE VERIFICATION
    H - HARDWARE RECONFIGURATION
    P - DEADSTART PANEL PARAMETERS
    S - SELECT DEADSTART DEVICE
    M - LOAD MDD
 ** O - CHANGE OS LOAD STATE
*** R - RELOAD CM/ESM FROM EDD TAPE

    (CR) - CONTINUE OS LOAD
    (BS) - PREVIOUS DISPLAY
```

CYBER 994 Only

```
        OPERATOR INTERVENTION
    LOAD STATE = NOS-NOS/BE DUAL CPU

    A - CONTINUE OS LOAD
    V - HARDWARE VERIFICATION
    H - HARDWARE RECONFIGURATION
    P - DEADSTART PANEL PARAMETERS
    S - SELECT DEADSTART DEVICE
    M - LOAD MDD
 ** O - CHANGE OS LOAD STATE
*** R - RELOAD CM/ESM FROM EDD TAPE

    (CR) - CONTINUE OS LOAD
    (BS) - PREVIOUS DISPLAY
```

CYBER 960/994 Only

```
        OPERATOR INTERVENTION
      LOAD STATE = NOS/VE

    A - CONTINUE OS LOAD
    H - HARDWARE RECONFIGURATION
****P - DEADSTART PANEL PARAMETERS
    M - LOAD MDD
 ** O - CHANGE OS LOAD STATE
*** R - RELOAD CM/ESM FROM EDD TAPE



    (CR) - CONTINUE OS LOAD
    (BS) - PREVIOUS DISPLAY
```

M05480-3

* Option not available on CYBER 960
** Option displayed if INITIALIZE MAINFRAME selected from UTILITIES display.
*** Option displayed if MRT on disk is valid and OS load state has not been changed.
**** Option not available with NOS/VE L739 and above.

Figure 2-9. Operator Intervention

(CR) or A - CONTINUE OS LOAD

Select this option from the OPERATOR INTERVENTION display to perform an operating system load. Refer to the description of the OS LOAD AUTOMATIC option on the INITIAL OPTIONS display (earlier in this section) for more information.

V - HARDWARE VERIFICATION (CYBER 994 NOS or NOS/BE Systems Only)

Select this option[6] from the OPERATOR INTERVENTION display to execute PP, CM, and CPU confidence tests.

Central memory contents are changed when you execute this option. This option cannot be executed if a level 3 NOS or NOS/BE deadstart is selected. For NOS/VE, a recovery deadstart will not be possible after this option has been executed.

NOTE

After executing this option, mainframe initialization is automatically selected.

Hardware that has been turned off via option H (HARDWARE RECONFIGURATION) cannot be tested. The names of the tests executed are: PCX, CMC, CT8, EJP, and MY1. Appendix E includes a brief description of each test.

If an error condition occurs, one of the following messages appears.

```
ERROR PP xx
ERROR CM
ERROR CPU xx
ERROR REG
```

where xx indicates the PP or CPU in error. When such an error occurs, inform a CE.

Upon successful test completion, the system displays:

```
TESTING COMPLETE-DEADSTART
```

When hardware verification is complete, press **Ctrl-F2** to return to the CONSOLE MAIN MENU, then initiate a deadstart. This will ensure that the system is returned to initial deadstart conditions prior to system loading.

6. Hardware Verification option not available on a CYBER 960 or 970.

H - HARDWARE RECONFIGURATION

Select this option from the OPERATOR INTERVENTION display to alter the mainframe hardware configuration. When selected, figure 2-10 appears.

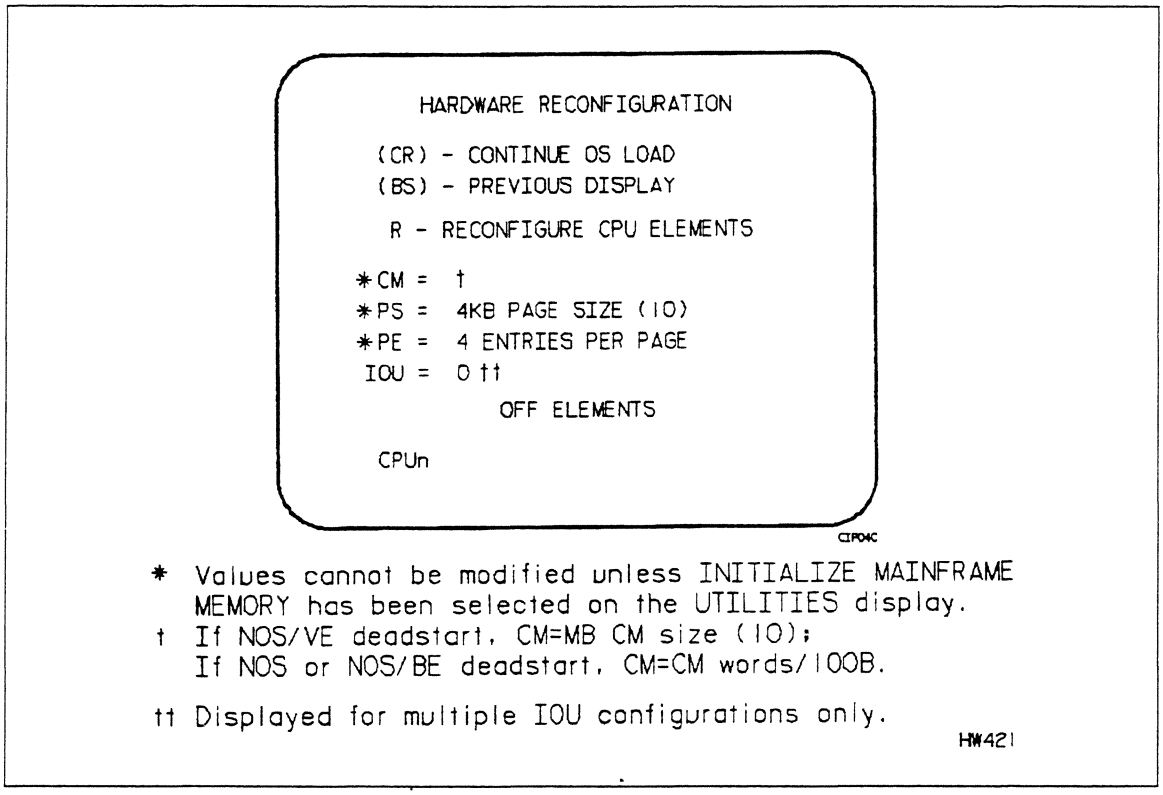

HARDWARE RECONFIGURATION
(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY
R - RECONFIGURE CPU ELEMENTS
*CM = †
*PS = 4KB PAGE SIZE (IO)
*PE = 4 ENTRIES PER PAGE
IOU = 0 ††
OFF ELEMENTS
CPUn
CIP04C
* Values cannot be modified unless INITIALIZE MAINFRAME MEMORY has been selected on the UTILITIES display.
† If NOS/VE deadstart, CM=MB CM size (IO);
If NOS or NOS/BE deadstart, CM=CM words/100B.
†† Displayed for multiple IOU configurations only.
HW421

Figure 2-10. Hardware Reconfiguration

The HARDWARE RECONFIGURATION display permits you to reconfigure central memory elements. To reconfigure CPU elements, type an R from the HARDWARE RECONFIGURATION display to select the RECONFIGURE CPU ELEMENTS display (figure 2-11).

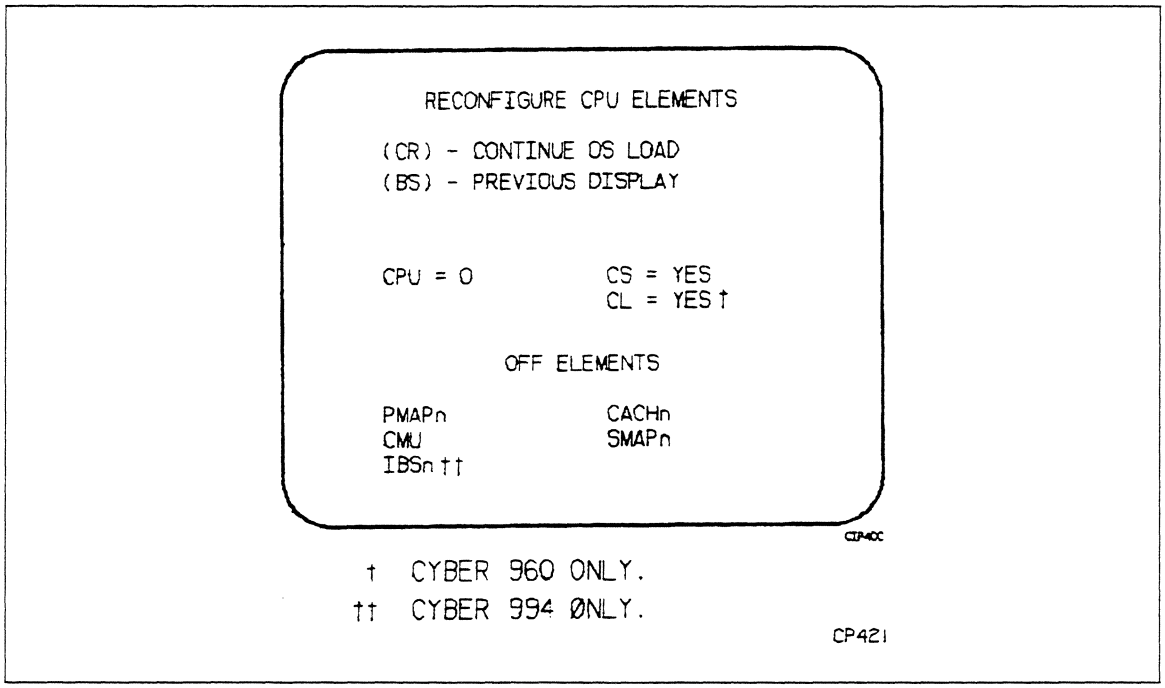


Figure 2-11. Reconfigure CPU Elements

The default hardware configuration includes every hardware element available for use. To change the hardware configuration, enter the appropriate entry on the HARDWARE RECONFIGURATION or RECONFIGURE CPU ELEMENTS display as described in table 2-1. When you turn off an element, its identifier is added to the OFF ELEMENTS list on the display. Entries are in the form keyword=option.

Table 2-1. Hardware Reconfiguration Entries

Keyword	Option	Display[1]	Function

CM=[2]	nnnnnnn	H	Specifies the size, in octal (for NOS or NOS/BE), of central memory in hundreds of words or in decimal (for NOS/VE). If not the first OS deadstart, changing this value also requires selecting INITIALIZE MAINFRAME.
			
			The following examples show the value you enter for nnnnnnn, given the central memory size for NOS, NOS/BE, or NOS/VE.
			
			CM Size in Decimal Words / CM Size in Megabytes / nnnnnnn
			131K / 1 / 4000
			262K / 2 / 10000
			524K / 4 / 20000
			1048K / 8 / 40000
			2097K / 16 / 100000
			4195K / 32 / 200000
			8390K / 64 / 400000
			16780K / 128 / 1000000
			33560K / 256 / 2000000
			67120K / 512 / 4000000
			134240K / 1024 / 10000000
			268480K / 2048 / 20000000
			
			If you enter `CM=0` or if you do not enter the CM=nnnnnnn parameter, the system defaults nnnnnnn to the maximum central memory size available.
			
			If you specify a value for nnnnnnn that exceeds the amount of physical memory, the system sends the following message:
			
			`UNAVAILABLE`
			
			If you specify a central memory size that is not large enough for a system deadstart, the system sets the maximum central memory size and the following message appears.
			
			`INVALID ENTRY`

1. H refers to HARDWARE RECONFIGURATION display; R refers to RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table.

(Continued)

Table 2-1. Hardware Reconfiguration Entries *(Continued)*

Keyword	Option	Display[1]	Function
CPUn=[2]	OFF/ON	H	Specifies the logical status of each available CPU. Values for n can be 0 or 1. On a two-CPU system, at least one must be ON. If you enter `CPU0=OFF` on a one-CPU system, the entry is ignored; the system uses the CPU.
CPU=	n	R	Specifies the CPU for which you are to reconfigure elements.
PPnn=[2]	OFF/ON	H	Logically turns OFF/ON one or more peripheral processors. Acceptable values for nn are 3 through 11 (excluding 10) and, if you have them, 20 through 31. Ranges may be specified. For example, PP5-7=OFF.
CPPnn=[2]	OFF/ON	H	Logically turns OFF/ON one or more CIO peripheral processors. Acceptable values for nn are 0 through 11B. Ranges may be specified. For example, CPP5-7=OFF. If no CIO PPs are installed, the system displays: `UNAVAILABLE`
IBSn=[2]	OFF/ON	R	(CYBER 994 only) Specifies the logical status of each set of the central processor instruction buffer stack. The value for n can be any number from 0-3 or in the form a-b (a less than b). At least 1 set must be present or `INVALID ENTRY` will be displayed.

1. H refers to HARDWARE RECONFIGURATION display; R refers to RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table.

(Continued)

Table 2-1. Hardware Reconfiguration Entries *(Continued)*

Keyword	Option	Display[1]	Function
PMAPn=[2]	OFF/ON	R	Specifies the logical status of each unit of the central processor page map. The value for n can be any number from 0 to 3. The value for n also can be in the form a-b (a through b); a and b can be any number from 0 to 3, and a is less than b. Turn OFF a page map unit only in the event of a hardware error. System performance degrades when a map unit is turned OFF.
CACHn=[2]	OFF/ON	R	Specifies logical status of each central processor cache unit. Acceptable values for n are 0 through 3. Ranges may be specified. For example, CACH0-1=OFF. Turn OFF a cache unit only in the event of a hardware error. System performance degrades when a cache unit is turned OFF.
SMAPn=[2]	OFF/ON	R	Specifies logical status of each central processor segment map unit. Acceptable values for n are 0, 1, or 0-1. For example, SMAP0-1=OFF. Turn OFF a segment map unit only in the event of a hardware error. When a segment map unit is turned off, system performance degrades.
PS=[2]	xx	H	Specifies the page size for standalone or dual state deadstarts (does not apply to NOS or NOS/BE standalone deadstarts). For CYBER 96X systems, allowable values (in decimal Kbytes) are 4, 8, and 16, for CYBER 99X systems with central memory less than or equal to 128 Mbytes, allowable values are 4, 8, and 16, and for CYBER 99X systems with central memory greater than 128 Mbytes, allowable values are 8 and 16. **NOTE** With an 887 or 895 disk unit, recommended values are 4, 8, and 16; with a file server, allowable values are 4 and 8; and with IM/DM, the only allowable value is 4.

1. H refers to HARDWARE RECONFIGURATION display; R refers to RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table.

(Continued)

Table 2-1. Hardware Reconfiguration Entries *(Continued)*

Keyword	Option	Display[1]	Function
PE=[2]	x	H	Specifies the number of page table entries per central memory page for standalone or dual state deadstarts (does not apply to NOS or NOS/BE standalone deadstarts).[3] If not the first OS deadstart, changing this value also requires selecting INITIALIZE MAINFRAME. Allowable values are 2, 4, and 8; however, the default value of 4 is intended as it provides optimal performance. Remaining values are intended for development use by CDC personnel only.
CMU=[2]	OFF/ON	R	Specifies logical status of the compare move unit.
IOUn=[2]	ON/OFF	H	Specifies the logical status of each available IOU. If not the first OS deadstart, changing this value also requires selecting INITIALIZE MAINFRAME. Values for n can be 0 or 1. If you enter `IOU0=OFF` you receive the message: `INVALID ENTRY` This applies to multiple IOUs only. The entry is invalid for single IOU systems.
IOU=n	0/1	H	Specifies the IOU for which you are to reconfigure elements. This applies to multiple IOUs only. The entry is invalid for single IOU systems.
CS=[2]	YES/NO	R	Specifies whether the system should load the central processor microcode into control store memory. The default is YES for all levels of deadstart. If NO is specified, the system does not load microcode from the CIP device into control store; whatever is there is used.
CL=[2]	YES/NO	R	Pertains to CYBER 960 and 970 only. Specifies whether the system should initialize the CPU clock system on an initialize mainframe deadstart. The default is YES. If `CL=NO`, or if utilizing a recovery type deadstart, the clock system is not initialized.

1. H refers to HARDWARE RECONFIGURATION display; R refers to RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table.

3. The PE value determines the size of the NOS/VE page table and affects the number of page table full conditions encountered.

P - DEADSTART PANEL PARAMETERS (NOS or NOS/BE Systems)

Select this option from the OPERATOR INTERVENTION display to change any of the following: the deadstart level, the CMRDECK, or deadstart program words 12 and 14. The DEADSTART PANEL PARAMETERS display (figure 2-12) appears. Table 2-2 lists the keyboard entries that you can enter to change the deadstart program parameters for NOS or NOS/BE.

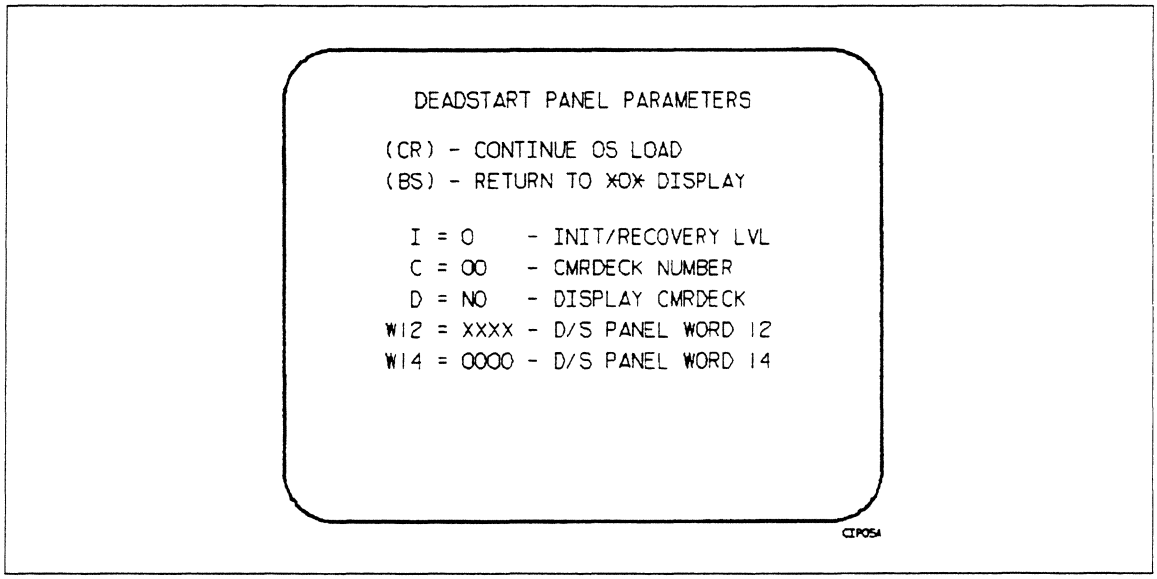

DEADSTART PANEL PARAMETERS
(CR) - CONTINUE OS LOAD
(BS) - RETURN TO XOX DISPLAY
I = 0 - INIT/RECOVERY LVL
C = 00 - CMRDECK NUMBER
D = NO - DISPLAY CMRDECK
W12 = XXXX - D/S PANEL WORD 12
W14 = 0000 - D/S PANEL WORD 14
CIP05A

Figure 2-12. Deadstart Panel Parameters for NOS or NOS/BE

Press **Enter** to cause system deadstart processing to continue with no further intervention on your part. Press **Backspace** to return to the OPERATOR INTERVENTION display.

Table 2-2. Keyboard Entries for the Deadstart Panel Parameters Display (NOS or NOS/BE)

Keyword	Function
I=x	Specifies the level of deadstart. The value of x can be 0, 1, 2, or 3.
C=xx	Specifies the CMRDECK (CMR for NOS/BE) number. The value of xx can be any number from 0 to 77 octal. Refer to the section 3 for information about CMRDECK/CMR selection.
D=xxx	Entry is not used by NOS/BE. For NOS, specifies whether the CMRDECK is to be displayed. The value of xxx can be YES for display CMRDECK, NO for do not display CMRDECK.
W12=xxxx	Specifies the value for deadstart program word 12. Refer to the section 3 for the proper setting.
W14=xxxx	Specifies the value for deadstart program word 14. Word 14 is reserved for the operating system or maintenance system.

P - DEADSTART PANEL PARAMETERS (NOS/VE Prior to L739)

Select this option from the OPERATOR INTERVENTION display to change the DCFILE or the operator pause entry. The display shown in figure 2-13 appears. Table 2-3 lists the keyboard entries that you can make to change the deadstart program parameters for NOS/VE.

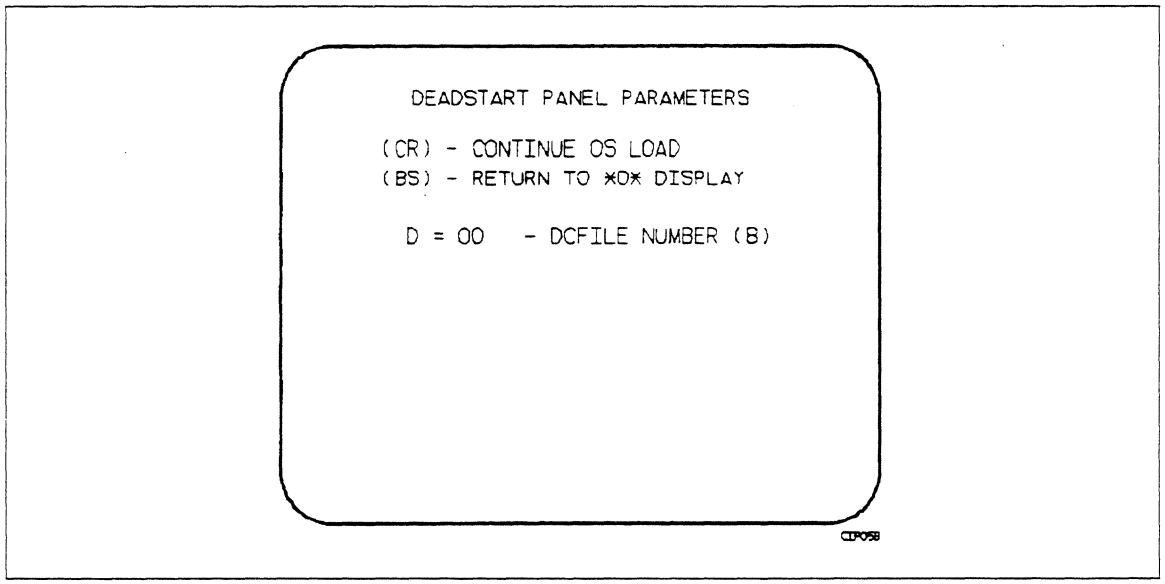


Figure 2-13. Deadstart Panel Parameters for NOS/VE

Press **Enter** to cause system deadstart processing to continue with no further intervention on your part. Press **Backspace** to return to the OPERATOR INTERVENTION display.

Table 2-3. Keyboard Entries for the Deadstart Panel Parameters Display (NOS/VE)

Keyword	Function
D=xx	Specifies the DCFILE number. The value of xx can be any number from 0 to 77 octal.

S - SELECT DEADSTART DEVICE (NOS/VE Prior to L739, NOS, and NOS/BE)

Select this option from the OPERATOR INTERVENTION display to specify an alternate disk or a tape device as the OS load device. From the SELECT OS DEADSTART DEVICE display (refer to figure 2-14), press **Enter** to cause system deadstart processing to continue with no further intervention on your part. You cannot select additional options after this entry; therefore, the CIP device is the OS device.

Press **Backspace** to return to the OPERATOR INTERVENTION display. Table 2-4 describes the allowable entries for the SELECT OS DEADSTART DEVICE display(s) shown in figure 2-14.

Table 2-4. SELECT OS DEADSTART DEVICE Display Options

Entry	Description
T	TAPE DEADSTART. Select this option for OS load from tape rather than from the CIP device. For NOS or NOS/BE deadstarts, the system prompts you for tape device type, channel, equipment, and unit. For NOS/VE deadstarts, the OS load is initiated upon selection of this option.
D	ALTERNATE DISK DEADSTART. Select this option to choose an alternate disk device for the OS load device. For NOS or NOS/BE deadstarts, the system prompts you for the disk channel, equipment, and unit. For NOS/VE deadstarts, the OS load is initiated upon selection of this option.

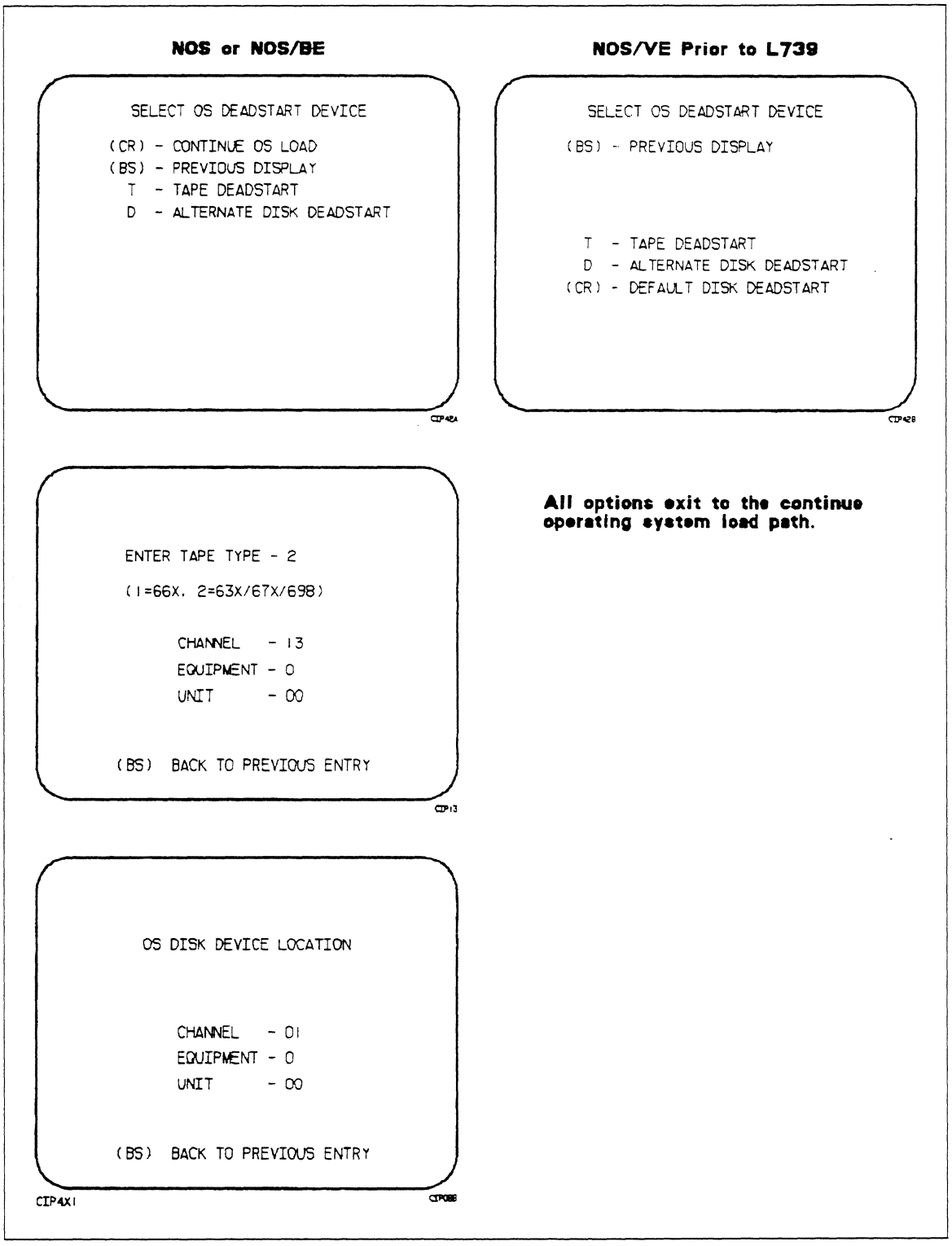


Figure 2-14. Deadstart Device

M - LOAD MDD

Select this option from the OPERATOR INTERVENTION display to load MDD; the display shown in figure 2-15 appears. This value is saved in MRT.

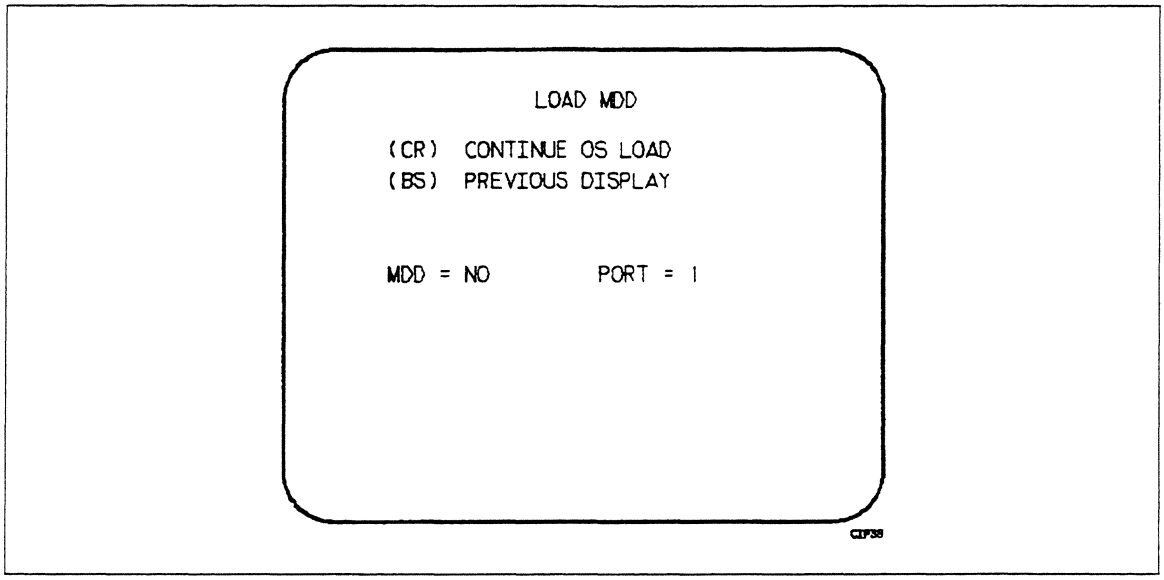


Figure 2-15. Load MDD

Direct the system to load MDD by typing:

```
MDD=YES
```

Select the port number of the TPM that MDD uses by typing:

```
PORT=n
```

where the parameter n is 0 or 1. The default port number is 0.

NOTE

1. Ensure the baud rate of the specified port of the TPM is set properly for the communications being used.

2. Turning on MDD at this time permanently locks MDD into a PP. If running in 180 stand alone, the MDD BYE command causes MDD mode to be turned off. Otherwise, the MDD BYE command has no effect when MDD is loaded via CTI.

Press **Enter** to cause system deadstart processing to continue with no further intervention on your part. Press **Backspace** to return to the OPERATOR INTERVENTION display.

O - CHANGE OS LOAD STATE

Select this option from the OPERATOR INTERVENTION display to change the OS load state to either a NOS or NOS/BE deadstart, a NOS/VE deadstart, or a NOS-NOS/BE dual CPU deadstart. The selected load state is displayed below the OPERATOR INTERVENTION display header.

Although the selected load state is saved in MRT when you execute an OS load, the load state will not be saved in MRT if you press **Backspace** to exit the OPERATOR INTERVENTION display before executing an OS load. To execute an OS load from the OPERATOR INTERVENTION display with no further intervention, press (**CR**).

NOTE

The NOS-NOS/BE dual CPU load state is only selectable on CYBER 994 dual CPU systems. This state, however, is automatically available on CYBER 960 or 970 dual CPU systems when the NOS or NOS/BE load state is selected.

On a dual CPU CYBER 960 or 970, the second CPU (CPU 1) is used by NOS if CPU 0 *and* CPU 1 are ON and the NOS CMRDECK does not contain a directive that enables future initialization of NOS/VE (dual state).

R - RELOAD CM FROM EDD TAPE

Select this option from the OPERATOR INTERVENTION display to reload CM/ESM from the specified EDD tape. This allows a recovery/continuation deadstart after any type of maintenance action (including a power off), provided that:

- A full EDD dump was taken prior to the maintenance action.
- The MRT is valid.
- No logical (MRT) or physical reconfiguration was done since the EDD dump was taken.
- A level 3 recovery has been selected for either NOS or NOS/BE, NOS-NOS/BE dual CPU, or continuation deadstart for NOS/VE.
- The OS load state was not changed since the EDD dump was taken.

Refer to Reloading CM From EDD Tape in chapter 4 of this manual.

Utilities Display, CIP Device Deadstart

Selecting the U option from the INITIAL OPTIONS display during a deadstart from the CIP device causes the UTILITIES display shown in figure 2-16 to appear.

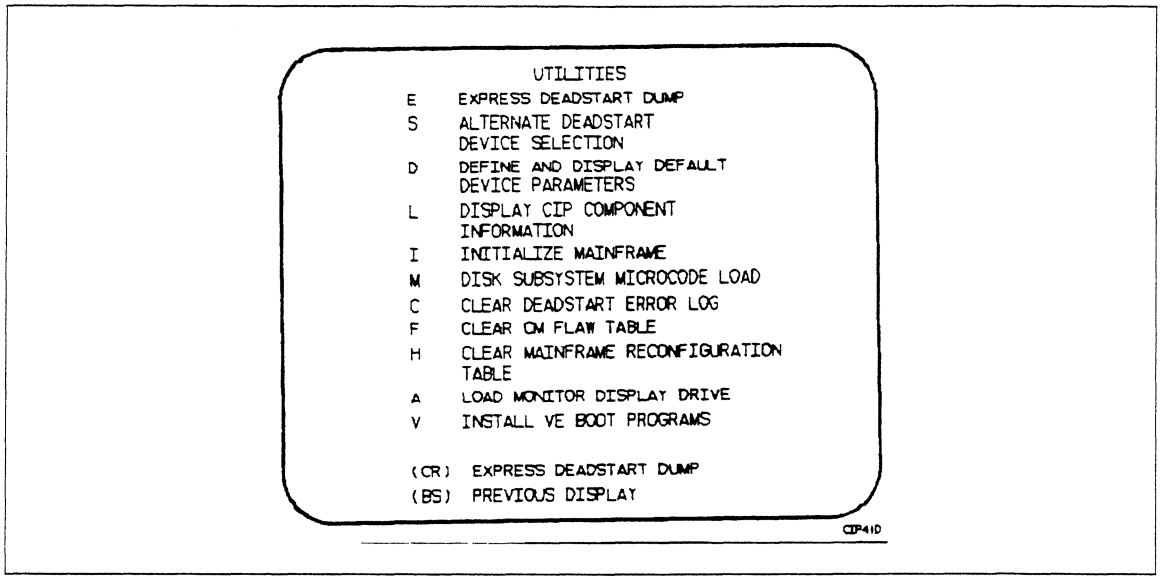

UTILITIES
E EXPRESS DEADSTART DUMP
S ALTERNATE DEADSTART DEVICE SELECTION
D DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS
L DISPLAY CIP COMPONENT INFORMATION
I INITIALIZE MAINFRAME
M DISK SUBSYSTEM MICROCODE LOAD
C CLEAR DEADSTART ERROR LOG
F CLEAR CM FLAW TABLE
H CLEAR MAINFRAME RECONFIGURATION TABLE
A LOAD MONITOR DISPLAY DRIVE
V INSTALL VE BOOT PROGRAMS
(CR) EXPRESS DEADSTART DUMP
(BS) PREVIOUS DISPLAY
CIP41D

Figure 2-16. Utilities, CIP Device Deadstart

(CR) or E - EXPRESS DEADSTART DUMP

Select this option from the UTILITIES display to dump the contents of PP memories, central memory, unified extended memory, CPU hardware registers, maintenance registers, processor control store memories, and tape and disk controlware to magnetic tape. Refer to Performing an Express Deadstart Dump in section 4 for procedures and further information.

NOTE

When the EXPRESS DEADSTART DUMP option is selected, CTI checks the error status of all system elements. If errors are encountered, CTI logs the errors in the DEL. If the DEL is full, CTI displays the errors before allowing the deadstart to continue; copy the displayed errors and give them to your CE.

S - ALTERNATE DEADSTART

Select this option from the UTILITIES display to specify an alternate CIP tape unit or disk device from which to deadstart. When this option is selected, the ALTERNATE DEADSTART display (figure 2-17) appears.

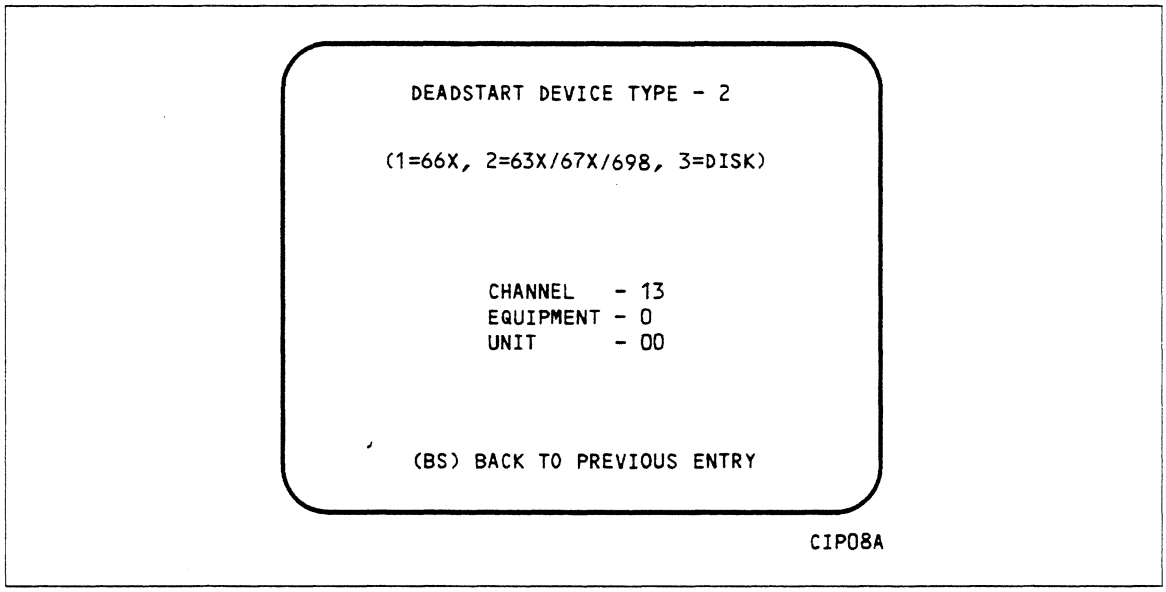


Figure 2-17. Alternate Deadstart

Execute the following procedures to specify an alternate CIP tape unit or disk device from which to deadstart.

___ 1. Enter the device type and press **Enter**. The system prompts you for channel, equipment, and unit numbers.

Default values are provided for the device parameters. The values are those specified in the default parameter block. The default parameter block is defined through option D of the UTILITIES display, DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS.

___ 2. After the device information is entered, press **Enter** to deadstart from the alternate device.

NOTE

Alternate deadstart from operating system deadstart tapes is not supported; to load the operating system from a tape file, select option T, OPERATING SYSTEM FILE ON TAPE, from the OPERATOR INTERVENTION display.

D - DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS

Select this option from the UTILITIES display to assign default values to the channel, equipment, and unit numbers of a CIP tape deadstart device, disk deadstart device, alternate disk deadstart device, tape dump (EDD) device, tape reload device, ESM channel, or printer dump device. Default values are initially assigned to the device parameters when CIP is installed.

L - DISPLAY CIP COMPONENT INFORMATION

Select this option from the UTILITIES display to display the release levels of the individual CIP components: microcode, EI, SCD, DFT, MDD, DFT, OS boot programs, and the valid or invalid status of the DEL, CFT, VCU, SCI, and MRT. An asterisk identifies components that have been installed manually.

M - DISK SUBSYSTEM MICROCODE LOAD

Select this option from the UTILITIES display to load peripheral microcode into the 844, 885, or 895 disk adapter and control module memory and install peripheral microcode onto specified drives. Refer to Loading and Installing Disk Subsystem Microcode in section 4 for procedures and additional information about this option.

C - CLEAR DEADSTART ERROR LOG

Select this option from the UTILITIES display to clear the data in the DEL.

H - CLEAR MAINFRAME RECONFIGURATION TABLE

Select this option from the UTILITIES display to clear the mainframe reconfiguration table data stored on disk. When you select this option, the following warning appears:

```
CLEARING THE MRT WILL CAUSE THE FOLLOWING ITEMS ON THE NEXT DEADSTART,

    ALL MAINFRAME MEMORIES WILL
    BE INITIALIZED FOR OS LOADS

    CM/ESM RELOAD FROM EDD TAPE OPTION
    WILL NOT BE AVAILABLE.

(CR) TO CONTINUE
(BS) BACKSPACE TO PREVIOUS DISPLAY
```

NOTE

Effective with the release of CIP Version 7, clearing the MRT forces a memory initialization by CTI. This was made necessary because with CM reload, CTI no longer writes CM (EI and the CIP Directory) on recovery deadstarts. This requires that the first word address (FWA) of the CIP buffer be maintained in the MRT.

I - INITIALIZE MAINFRAME

Select this option from the UTILITIES display to initialize the mainframe after power interruption or maintenance activity has occured. The INITIAL OPTIONS display reappears with the following message on the bottom of the display:

```
ALL MAINFRAME MEMORIES WILL
BE INITIALIZED FOR MSL/OS LOADS
```

Mainframe initialization, including initialization of central memory, PP memory, and maintenance registers, occurs when you select this option and then perform either an operating system load on a level 0, 1, or 2 (not 3) deadstart or select the off-line maintenance option. Refer to section 4 for power-on initialization procedures.

A - LOAD MONITOR DISPLAY DRIVER

Select this option from the UTILITIES display to execute MDD in a standalone mode (not concurrent with the operating system). When you specify A, the MDD PARAMETERS display (figure 2-18) appears.

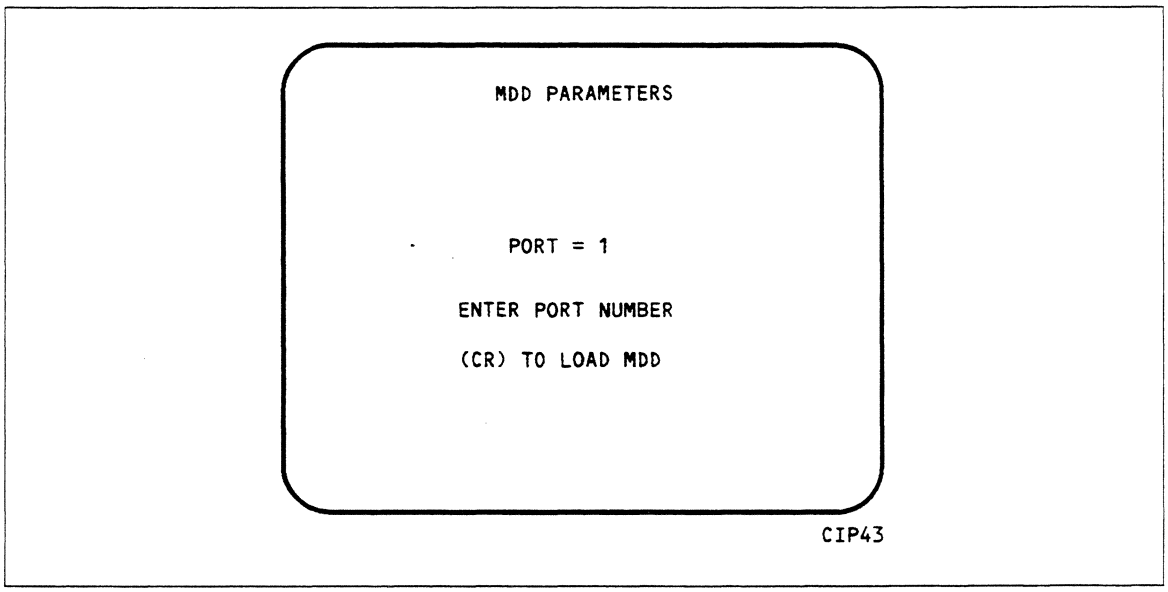


Figure 2-18. MDD Parameters

Procedures for using MDD are:

___ 1. Enter the port number if different than the one displayed. Press **Enter** to cause MDD to load.

___ 2. When you have finished using MDD, a deadstart is required. Refer to section 5 for the uses of MDD.

The LOAD MDD option is used to support an analysis of a mainframe's state, once a system interrupt has been encountered. This option should only be selected if an operating system has been previously loaded.

CTI loads MDD from central memory (MDD is stored in CM during a system load) and then issues the following message if a checksum of the MDD program from central memory fails.

```
UNABLE TO LOAD MDD.

THE INTEGRITY OF CENTRAL MEMORY
HAS BEEN COMPROMISED.
```

For detatiled information on MDD, refer to section 5 of this manual.

V - INSTALL OS BOOT PROGRAMS

Select this option from the UTILITIES display to install or replace the OS boot programs in the CIP device. When you specify this option, figure 2-19 appears; you must then indicate the path of the tape drive, from which the OS boot programs are coming.

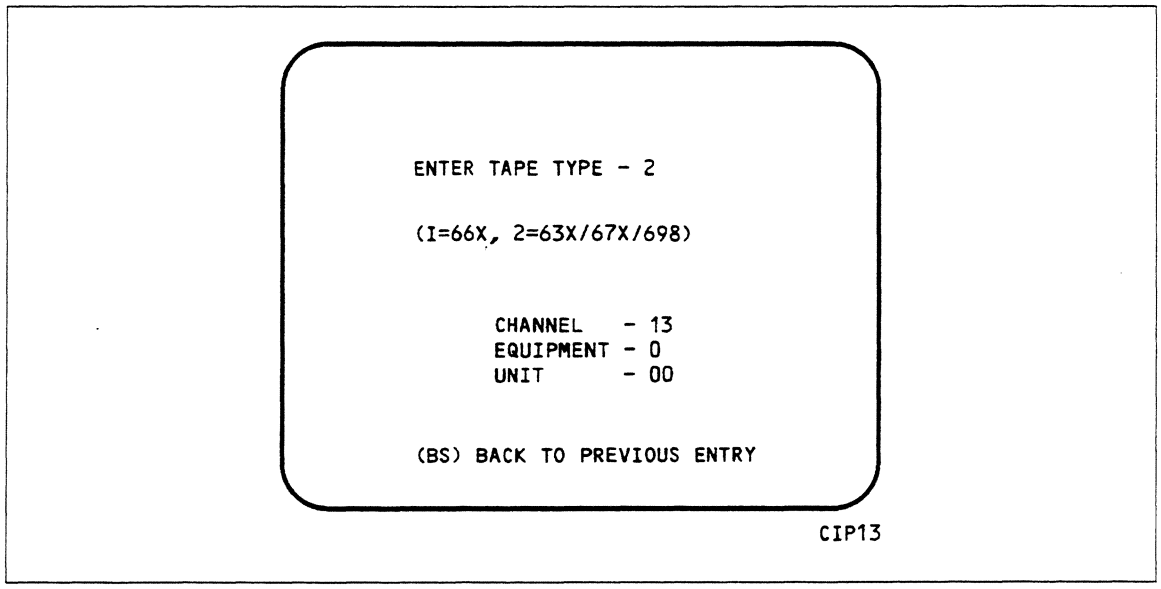


Figure 2-19. Path Select Display

Deadstart Displays and Options, CIP Tape Deadstart

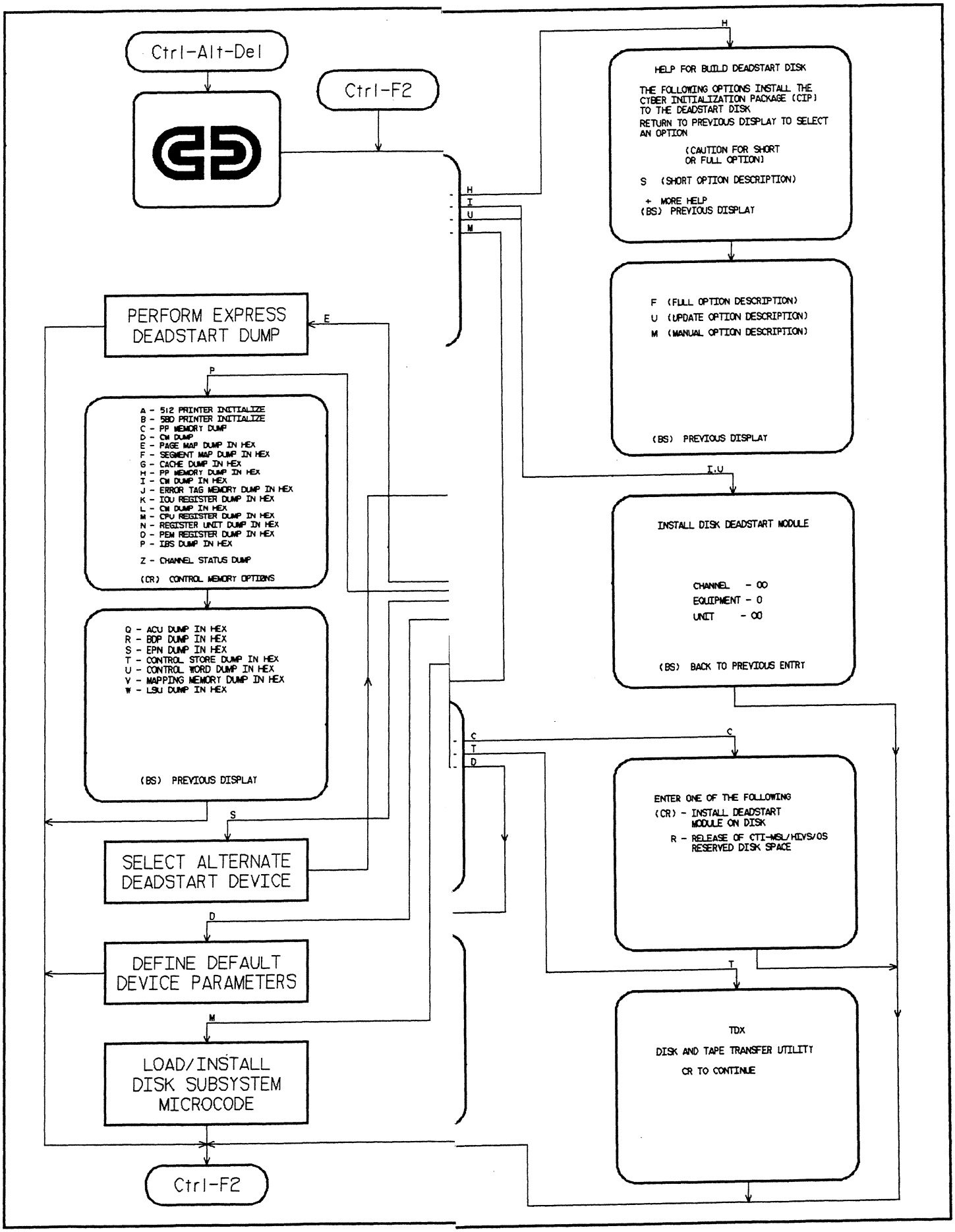
The CIP tape deadstart displays and options included in this subsection incorporate the following conventions.

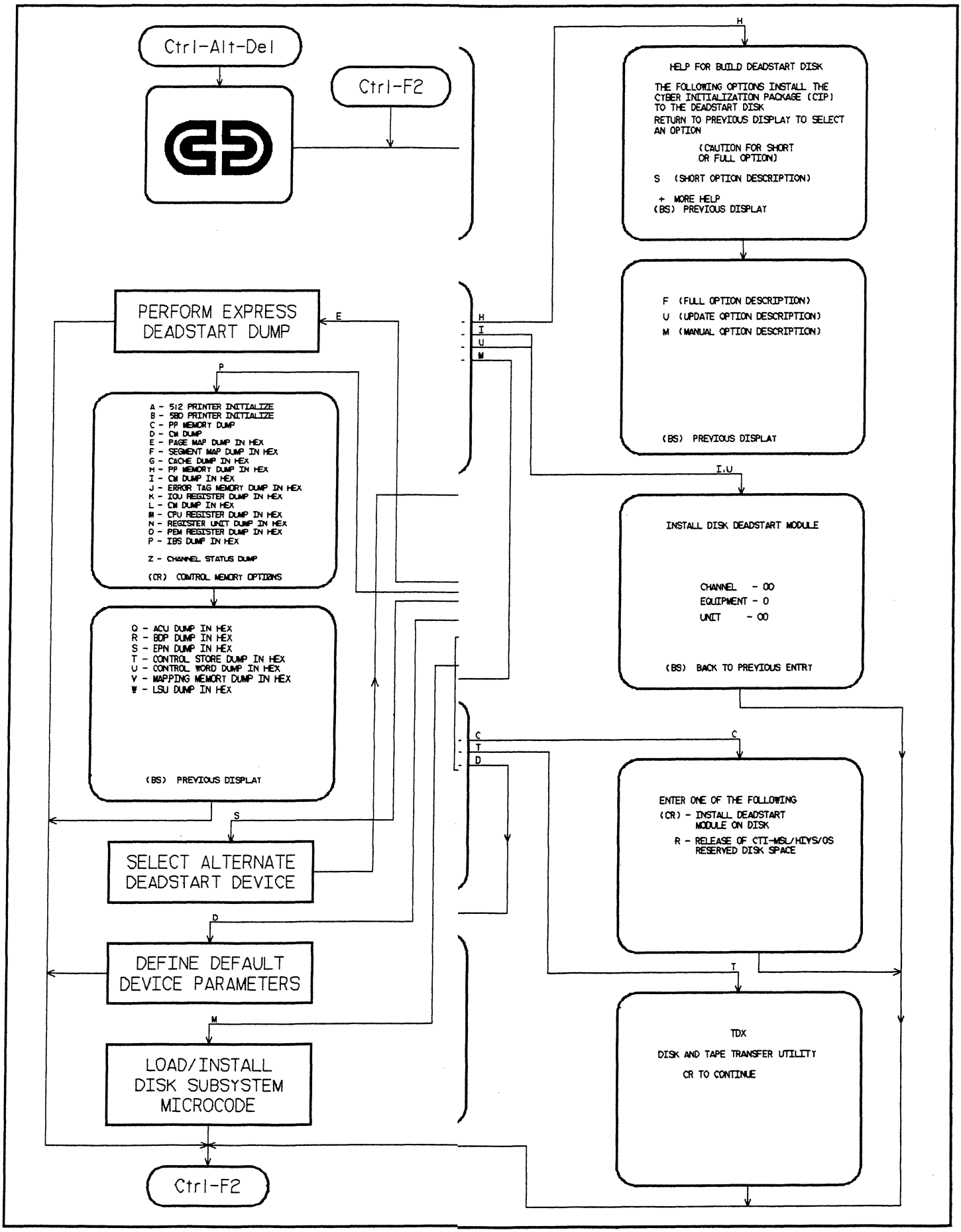
- Pressing **Enter** automatically selects the default option; the first option listed on a menu display is the default option.
- Pressing **Backspace** returns you to the previous display.
- Pressing **Ctrl-F2** returns you to the CONSOLE MAIN MENU display.

Additionally, help information is provided for the INITIAL OPTIONS display; the HELP display supplies abbreviated information about the options.

Overview

Figures 2-20 and 2-21 provide an overview of the displays and options available during a deadstart from CIP tape for a single IOU and dual IOU system, respectively.


Ctrl-Alt-Del
Ctrl-F2
H
I
U
M
HELP FOR BUILD DEADSTART DISK
THE FOLLOWING OPTIONS INSTALL THE CYBER INITIALIZATION PACKAGE (CIP) TO THE DEADSTART DISK
RETURN TO PREVIOUS DISPLAY TO SELECT AN OPTION
(CAUTION FOR SHORT OR FULL OPTION)
S (SHORT OPTION DESCRIPTION)
+ MORE HELP
(BS) PREVIOUS DISPLAY
F (FULL OPTION DESCRIPTION)
U (UPDATE OPTION DESCRIPTION)
M (MANUAL OPTION DESCRIPTION)
(BS) PREVIOUS DISPLAY
PERFORM EXPRESS DEADSTART DUMP
E
P
A - 512 PRINTER INITIALIZE
B - 580 PRINTER INITIALIZE
C - PP MEMORY DUMP
D - CM DUMP
E - PAGE MAP DUMP IN HEX
F - SEGMENT MAP DUMP IN HEX
G - CACHE DUMP IN HEX
H - PP MEMORY DUMP IN HEX
I - CM DUMP IN HEX
J - ERROR TAG MEMORY DUMP IN HEX
K - IOU REGISTER DUMP IN HEX
L - CM DUMP IN HEX
M - CPU REGISTER DUMP IN HEX
N - REGISTER UNIT DUMP IN HEX
O - PEM REGISTER DUMP IN HEX
P - IBS DUMP IN HEX
Z - CHANNEL STATUS DUMP
(CR) CONTROL MEMORY OPTIONS
Q - ACU DUMP IN HEX
R - BDP DUMP IN HEX
S - EPN DUMP IN HEX
T - CONTROL STORE DUMP IN HEX
U - CONTROL WORD DUMP IN HEX
V - MAPPING MEMORY DUMP IN HEX
W - LSU DUMP IN HEX
(BS) PREVIOUS DISPLAY
I,U
INSTALL DISK DEADSTART MODULE
CHANNEL - 00
EQUIPMENT - 0
UNIT - 00
(BS) BACK TO PREVIOUS ENTRY
C
T
D
C
ENTER ONE OF THE FOLLOWING
(CR) - INSTALL DEADSTART MODULE ON DISK
R - RELEASE OF CTI-MSL/MIVS/OS RESERVED DISK SPACE
S
SELECT ALTERNATE DEADSTART DEVICE
D
DEFINE DEFAULT DEVICE PARAMETERS
T
TDX
DISK AND TAPE TRANSFER UTILITY
CR TO CONTINUE
M
LOAD/INSTALL DISK SUBSYSTEM MICROCODE
Ctrl-F2


Ctrl-Alt-Del
Ctrl-F2
H
HELP FOR BUILD DEADSTART DISK
THE FOLLOWING OPTIONS INSTALL THE CYBER INITIALIZATION PACKAGE (CIP) TO THE DEADSTART DISK
RETURN TO PREVIOUS DISPLAY TO SELECT AN OPTION
(CAUTION FOR SHORT OR FULL OPTION)
S (SHORT OPTION DESCRIPTION)
+ MORE HELP
(BS) PREVIOUS DISPLAY
F (FULL OPTION DESCRIPTION)
U (UPDATE OPTION DESCRIPTION)
M (MANUAL OPTION DESCRIPTION)
(BS) PREVIOUS DISPLAY
PERFORM EXPRESS DEADSTART DUMP
E
H
I
U
M
P
A - 512 PRINTER INITIALIZE
B - 580 PRINTER INITIALIZE
C - PP MEMORY DUMP
D - CM DUMP
E - PAGE MAP DUMP IN HEX
F - SEGMENT MAP DUMP IN HEX
G - CACHE DUMP IN HEX
H - PP MEMORY DUMP IN HEX
I - CM DUMP IN HEX
J - ERROR TAG MEMORY DUMP IN HEX
K - IOU REGISTER DUMP IN HEX
L - CM DUMP IN HEX
M - CPU REGISTER DUMP IN HEX
N - REGISTER UNIT DUMP IN HEX
O - PEM REGISTER DUMP IN HEX
P - IBS DUMP IN HEX
Z - CHANNEL STATUS DUMP
(CR) CONTROL MEMORY OPTIONS
I,U
INSTALL DISK DEADSTART MODULE
CHANNEL - 00
EQUIPMENT - 0
UNIT - 00
(BS) BACK TO PREVIOUS ENTRY
Q - ACU DUMP IN HEX
R - BDP DUMP IN HEX
S - EPN DUMP IN HEX
T - CONTROL STORE DUMP IN HEX
U - CONTROL WORD DUMP IN HEX
V - MAPPING MEMORY DUMP IN HEX
W - LSU DUMP IN HEX
(BS) PREVIOUS DISPLAY
C
T
D
C
ENTER ONE OF THE FOLLOWING
(CR) - INSTALL DEADSTART MODULE ON DISK
R - RELEASE OF CTI-MSL/MCYS/OS RESERVED DISK SPACE
S
SELECT ALTERNATE DEADSTART DEVICE
D
DEFINE DEFAULT DEVICE PARAMETERS
T
TDX
DISK AND TAPE TRANSFER UTILITY
CR TO CONTINUE
M
LOAD/INSTALL DISK SUBSYSTEM MICROCODE
Ctrl-F2

Console Main Menu, Deadstart From CIP Device

The CONSOLE MAIN MENU (figure 2-22) appears when you:

- Apply power to your CC598-B/E console.
- Press **Ctrl-Alt-Del** on your CC598-B/E console keyboard.
- Press **Ctrl-F2** on your CC598-B/E console keyboard.

After applying power to your console or after pressing **Ctrl-Alt-Del**, the CDC logo appears first; the CONSOLE MAIN MENU appears approximately 10 seconds later. The CONSOLE MAIN MENU appears immediately after pressing **Ctrl-F2**.

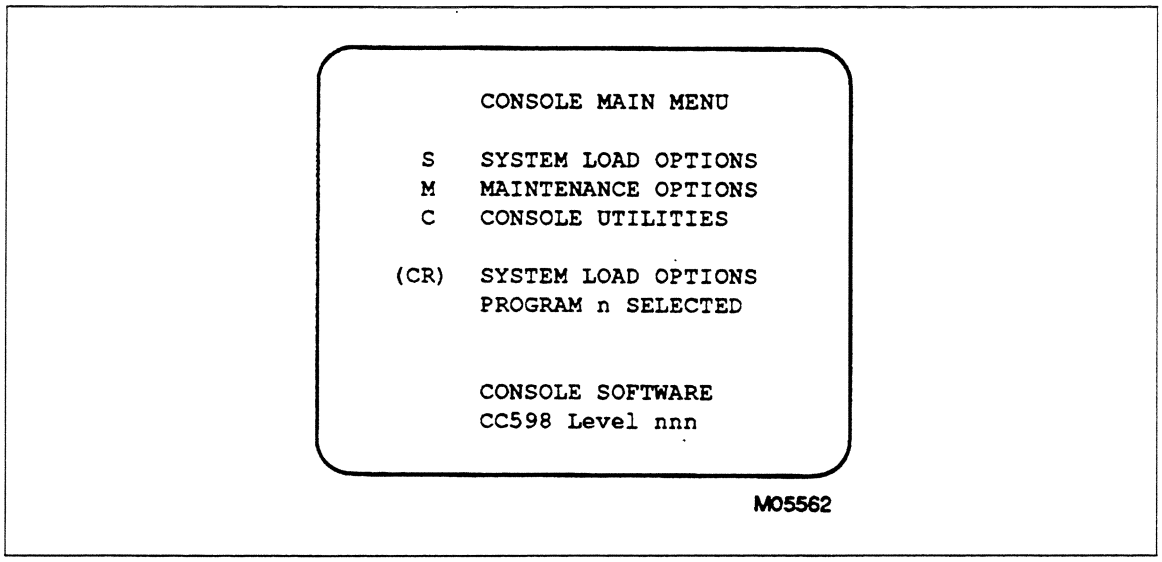


Figure 2-22. Console Main Menu

S - SYSTEM LOAD OPTIONS

Select this option from the CONSOLE MAIN MENU to initialize the system. Because current system activity will be terminated by proceeding with this option, the warning display shown in figure 2-23 appears. From the warning display, press **Enter** to proceed with the option or press **Esc** to return to the CONSOLE MAIN MENU. If you press **Enter** to proceed with the option, the system is initialized and the INITIAL OPTIONS display (figure 2-27) appears.

For a description of INITIAL OPTIONS display selections, refer to Initial Options Display, CIP Device Deadstart, later in this section.

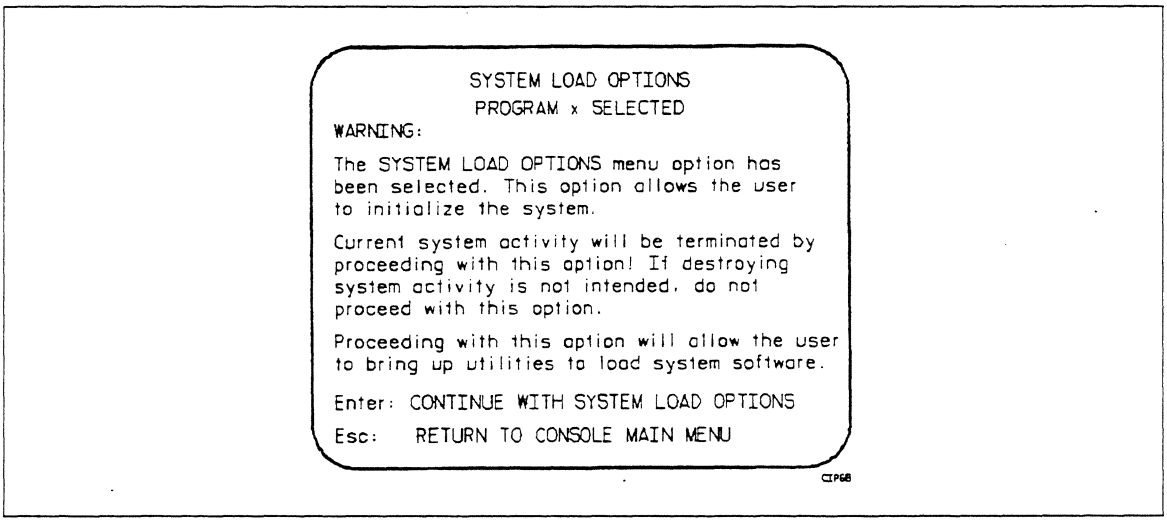

SYSTEM LOAD OPTIONS
PROGRAM x SELECTED
WARNING:
The SYSTEM LOAD OPTIONS menu option has been selected. This option allows the user to initialize the system.
Current system activity will be terminated by proceeding with this option! If destroying system activity is not intended, do not proceed with this option.
Proceeding with this option will allow the user to bring up utilities to load system software.
Enter: CONTINUE WITH SYSTEM LOAD OPTIONS
Esc: RETURN TO CONSOLE MAIN MENU
CIP68

Figure 2-23. System Load Options Warning Display

M - MAINTENANCE OPTIONS

Select this option from the CONSOLE MAIN MENU to bring up the MAINTENANCE OPTIONS - IOU0 display (figure 2-24) on single IOU systems or to bring up the MAINTENANCE OPTIONS menu (figure 2-25) on dual IOU systems.

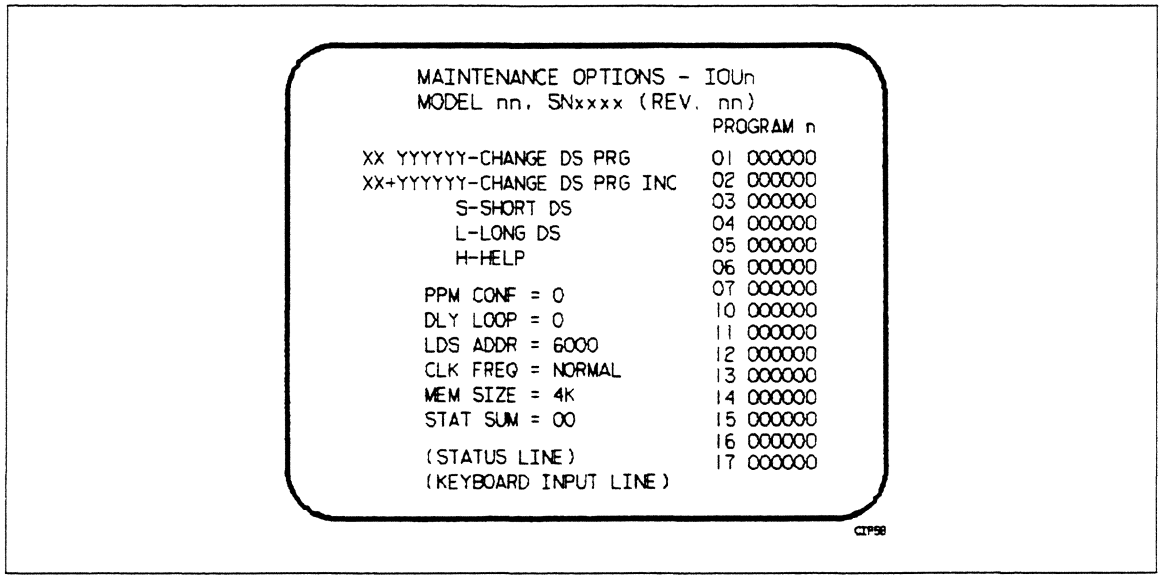


Figure 2-24. Maintenance Options - IOUn Display

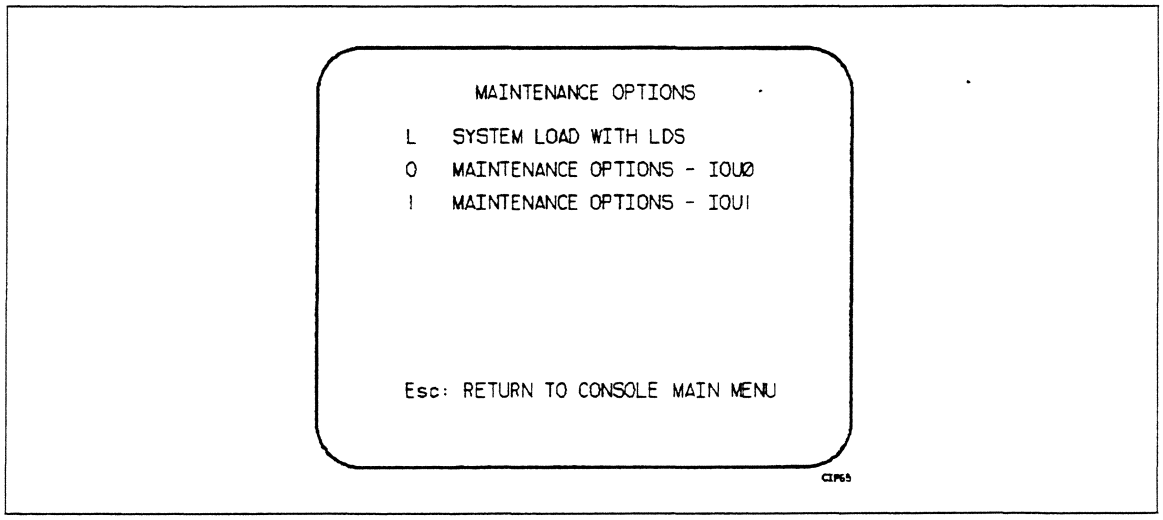

MAINTENANCE OPTIONS
L SYSTEM LOAD WITH LDS
0 MAINTENANCE OPTIONS - IOU0
1 MAINTENANCE OPTIONS - IOU1
Esc: RETURN TO CONSOLE MAIN MENU
CTP65

Figure 2-25. Maintenance Options Menu (Dual IOU Systems Only)

L - SYSTEM LOAD WITH LDS (Dual IOU Systems Only)

Select this option from the MAINTENANCE OPTIONS menu to bring up the dynamic[7] MAINTENANCE OPTION display shown in figure 2-26.

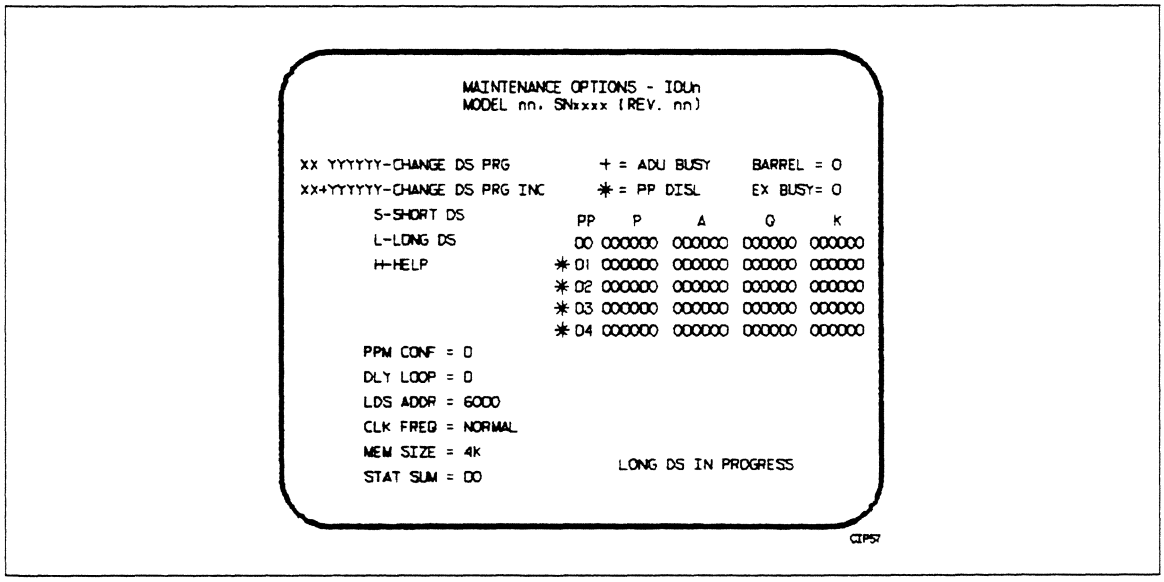


Figure 2-26. Maintenance Options Display (System Load With LDS)

0 - MAINTENANCE OPTIONS - IOU0 (Dual IOU Systems Only)

Select this option from the MAINTENANCE OPTIONS menu (figure 2-25) to bring up the MAINTENANCE OPTIONS - IOU0 display (refer to figure 2-24). For additional information about this option, refer to the MSL 15X Off-Line Reference Manual listed in About This Manual.

1 - MAINTENANCE OPTIONS - IOU1 (Dual IOU Systems Only)

Select this option from the MAINTENANCE OPTIONS menu (figure 2-25) to bring up the MAINTENANCE OPTIONS - IOU1 display (refer to figure 2-24). For additional information about this option, refer to the MSL 15X Off-Line Reference Manual listed in About This Manual.

7. Registers located in the upper right-hand quadrant of this display will change on your console.

Initial Options Display, CIP Tape Deadstart

The INITIAL OPTIONS display (figure 2-27) is the first screen to appear after a deadstart from CIP tape is executed. When the deadstart program is set for deadstart from the CIP tape, the INITIAL OPTIONS display provides utilities to install CIP onto the CIP device. A CIP tape deadstart also allows execution of several utilities from tape, should the CIP device be unusable.

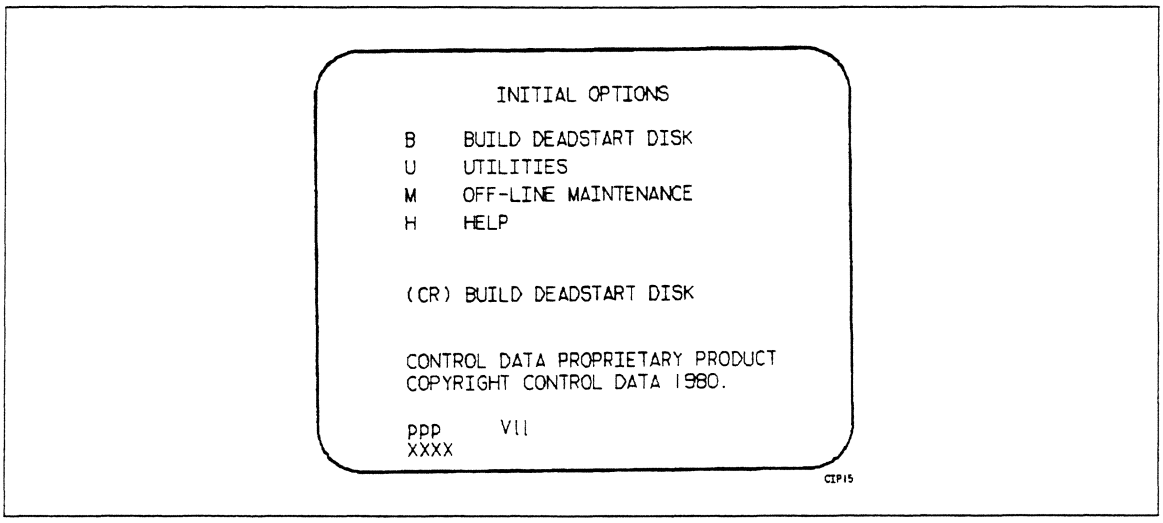


Figure 2-27. Initial Options From CIP Tape

The mainframe type (ppp)[8] and the CIP version number (VII) is displayed at the bottom of the INITIAL OPTIONS display. At the very bottom of the display, the PSR level (XXXX) is given.

(CR) or B - BUILD DEADSTART DISK

Select this option from the INITIAL OPTIONS display to install CIP onto the CIP device. The CIP modules, which are used to initialize the mainframe and establish the operating environment, must reside on the CIP device before an operating system deadstart can be performed. Refer to CIP Installation earlier in this section.

U - UTILITIES

Select this option from the INITIAL OPTIONS display to bring up the UTILITIES display (figure 2-28). Refer to Utilities Display, CIP Tape Deadstart, later in this section for a description of the UTILITIES options.

M - OFF-LINE MAINTENANCE

Select this option from the INITIAL OPTIONS display to allow execution of hardware tests for preventive maintenance or hardware error diagnosis. Information about the option is included in the MSL 15X Reference Manual listed in About This Manual.

The contents of word 12 of the deadstart program also affect the M option. Refer to Setting Word 12 in section 3 of this manual.

8. 960, 970, or 994 will appear in place of ppp.

Execution of the hardware diagnostics from tape is much slower than from disk. Use tape only when your CIP device is not usable.

NOTE

After executing this option, it will be necessary to select the INITIALIZE MAINFRAME option from the UTILITIES display for proper OS loading to occur.

H - HELP

Select HELP to display a brief description of each option within the INITIAL OPTIONS display.

Build Deadstart Disk Display

The BUILD DEADSTART DISK display (figure 2-28) appears when you select option B, BUILD DEADSTART DISK, from the INITIAL OPTIONS display. The BUILD DEADSTART DISK display is available only when you deadstart from the CIP tape. This display provides the options that install CIP onto the CIP device. Refer to CIP Installation, earlier in this section, for CIP installation procedures and displays.

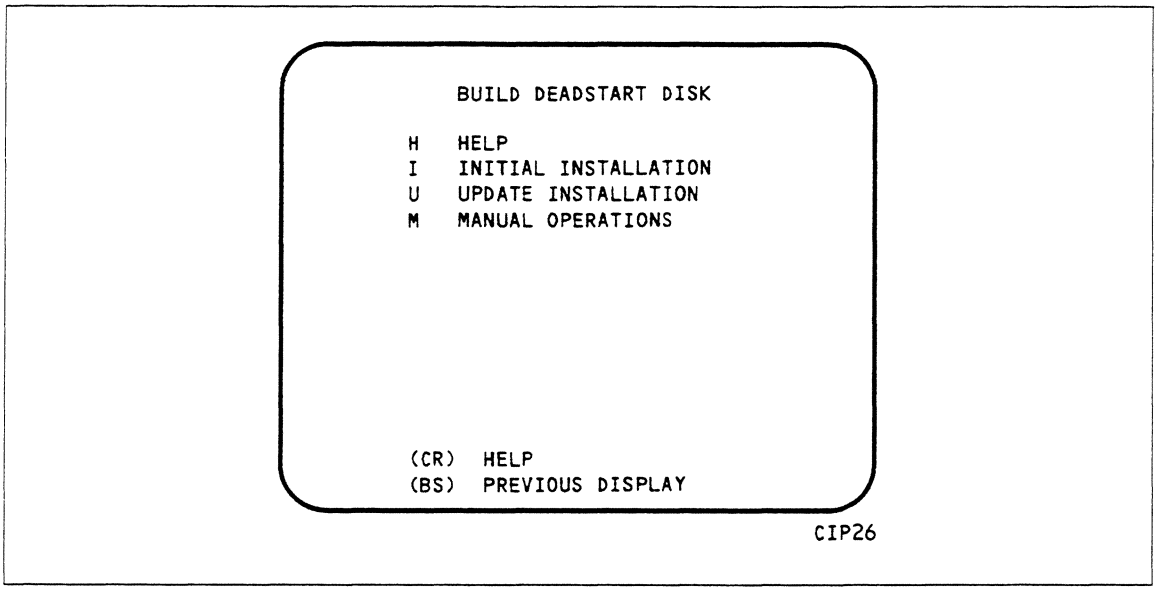


Figure 2-28. Build Deadstart Disk

(CR) or H - HELP

Select HELP to display a brief description of each BUILD DEADSTART DISK display option.

I - INITIAL INSTALLATION

Select this option from the BUILD DEADSTART DISK display to initialize the CIP device and install all of CIP onto the CIP device.

CAUTION

The INITIAL INSTALLATION option destroys all information on the CIP device, except the disk microcode, prior to installing CIP. Before an initial installation, ensure that you have a backup copy of any information on the CIP device that you want to preserve (including operating system permanent files and CE command buffers). After an initial installation, you must perform an operating system initialization of the CIP device.

U - UPDATE INSTALLATION

Select this option from the BUILD DEADSTART DISK display to replace CIP on the CIP device some time after the short/full installation. The update option preserves operating system information on the CIP device.

M - MANUAL OPERATIONS

Select this option from the BUILD DEADSTART DISK display to perform an emergency replacement of CIP component(s) at any time after CIP has been installed. Refer to Manual Operations Display, later in this section.

Manual Operations Display

The MANUAL OPERATIONS display (figure 2-29) appears when you select option M, MANUAL OPERATIONS, from the BUILD DEADSTART DISK display (figure 2-28). Manual operations are available only when you deadstart from the CIP tape.

Manual operations allow manual replacement of individual CIP components, which may be required in the event of a critical problem. Refer to Emergency CIP Repair Procedures in section 4 for repair and manual replacement procedures. More detailed information about manual operations is provided in the MSL 15X Reference Manual listed in About This Manual.

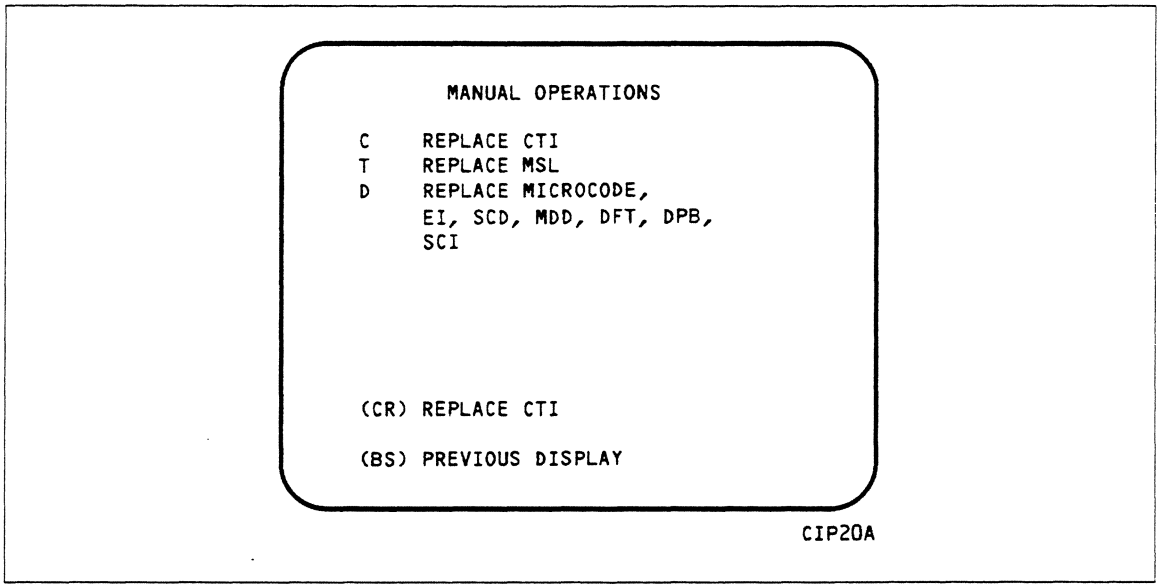


Figure 2-29. Manual Operations

(CR) or C - REPLACE CTI

Select this option from the MANUAL OPERATION display to replace the CTI component of CIP on the CIP device.

NOTE

This option also provides the capability to release CTI-MSL/HIVS/OS disk space. For detailed procedures, see Build Deadstart Disk Operations in section 4.

T - REPLACE MSL

Select this option from the MANUAL OPERATIONS display to replace the MSL component of CIP on the CIP device.

D - REPLACE MICROCODE, EI, SCD, MDD, DFT, DPB, SCI.

NOTE

Select this option only after an initial installation has been performed.

Select this option from the MANUAL OPERATIONS display to replace microcode, EI, the CC634B SCD, MDD, DFT, DPB, SCI, or to initialize the CDA. When this option is selected, you are prompted to enter the disk channel and disk unit numbers. After you enter the channel and unit numbers or press **Enter** to accept the default values shown, the REPLACE CTI/MSL DISK AREA MODULE display shown in figure 2-30 appears. Options A through H of this display manually replace CIP modules in the CDA of the CIP device.

Select option Y of the REPLACE CTI/MSL DISK AREA MODULE display to display the level numbers of the programs resident in the CDA of the CIP device. If any module has been manually replaced, an asterisk appears by the module name on this display.

Select option Z of the REPLACE CTI/MSL DISK AREA MODULE display to initialize the CDA. This option will execute options A through H and will also initialize the following:

- The Deadstart Error Log (DEL).
- The MRT which identifies the logical state of all mainframe elements. Any of these elements previously defined as logically "OFF" must be redesignated as such.

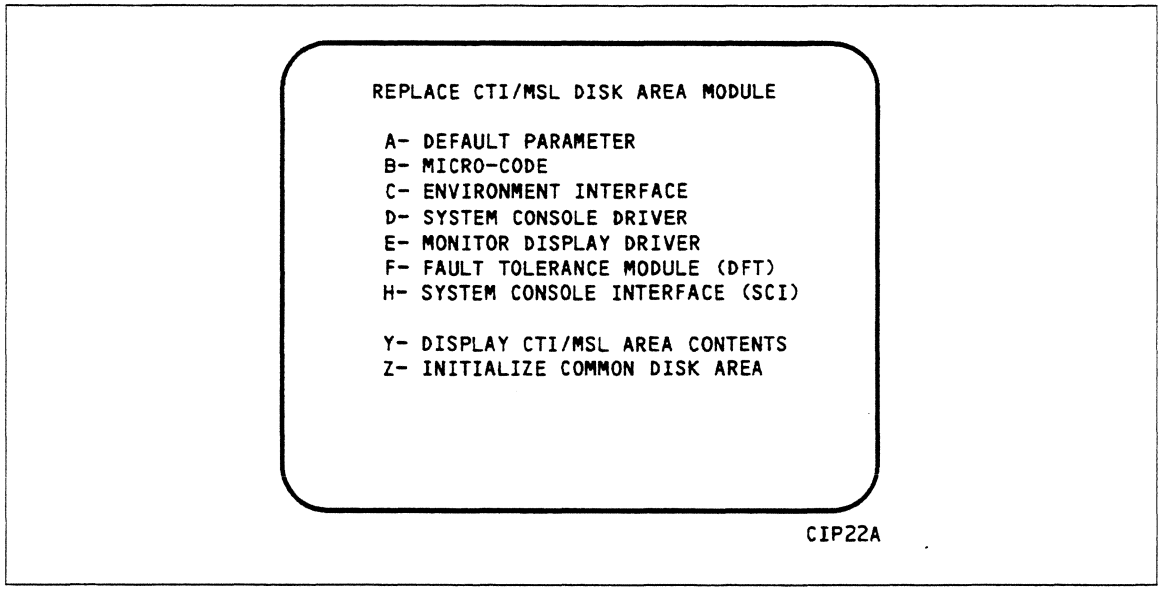


Figure 2-30. Replace CTI/MSL Disk Area Module

Utilities Display, CIP Tape Deadstart

Selecting the U option from the INITIAL OPTIONS display during a deadstart from CIP tape causes the UTILITIES display shown in figure 2-31 to appear.

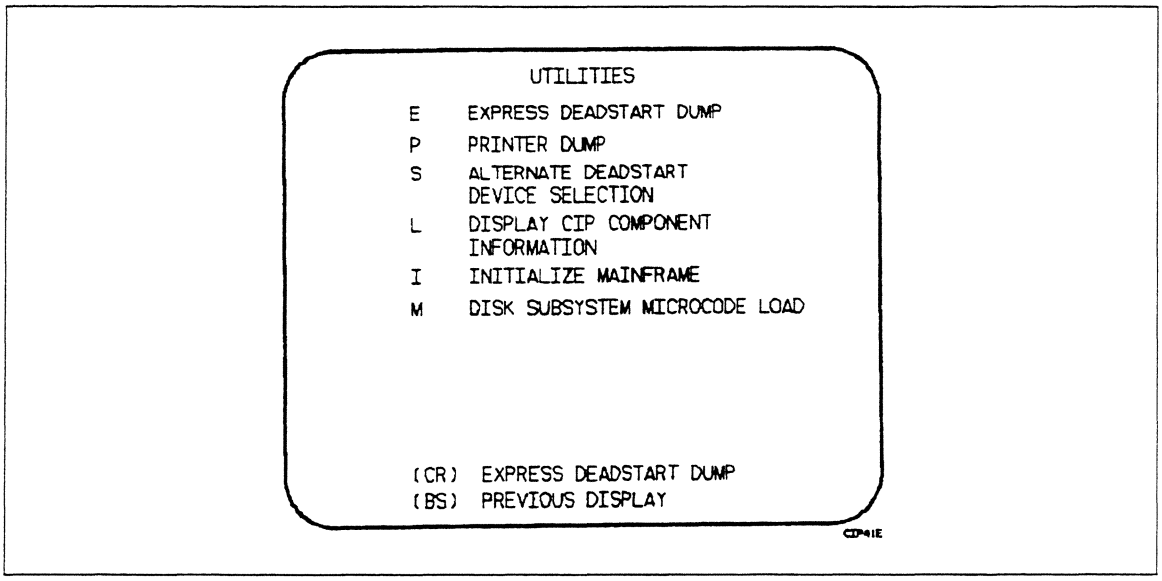


Figure 2-31. Utilities, CIP Tape Deadstart

(CR) or E - EXPRESS DEADSTART

Select this option from the UTILITIES display to dump the contents of PP memories, central memory, unified extended memory, CPU hardware registers, maintenance registers, processor control store memories, and tape and disk controlware to magnetic tape. Refer to Performing an Express Deadstart Dump in section 4 for further information.

P - PRINTER DUMP

Select this option from the UTILITIES display to dump central memory, PP memory, or maintenance register contents to a line printer. When you specify P, the DUMP TO PRINTER OPTIONS display (figure 2-32 or 2-33) appears. You cannot return to the UTILITIES display from the DUMP TO PRINTER OPTIONS display; you must redeadstart the system. Table 2-5 lists the keyboard entries for performing a printer dump. For more information refer to Performing a Printer Dump in section 4.

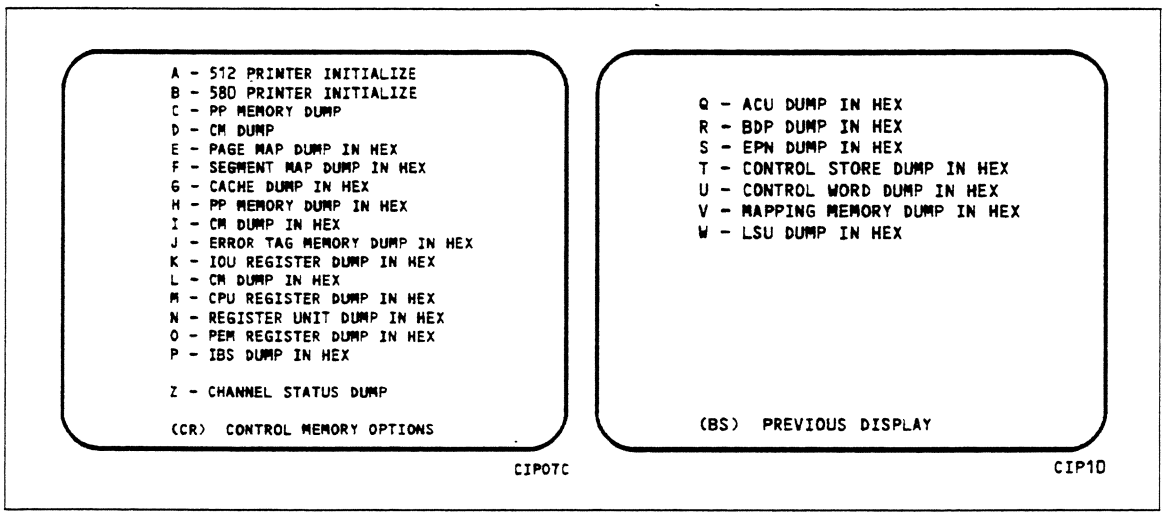

A - 512 PRINTER INITIALIZE
B - 580 PRINTER INITIALIZE
C - PP MEMORY DUMP
D - CM DUMP
E - PAGE MAP DUMP IN HEX
F - SEGMENT MAP DUMP IN HEX
G - CACHE DUMP IN HEX
H - PP MEMORY DUMP IN HEX
I - CM DUMP IN HEX
J - ERROR TAG MEMORY DUMP IN HEX
K - IOU REGISTER DUMP IN HEX
L - CM DUMP IN HEX
M - CPU REGISTER DUMP IN HEX
N - REGISTER UNIT DUMP IN HEX
O - PEM REGISTER DUMP IN HEX
P - IBS DUMP IN HEX
Z - CHANNEL STATUS DUMP
(CR) CONTROL MEMORY OPTIONS
CIP07C
Q - ACU DUMP IN HEX
R - BDP DUMP IN HEX
S - EPN DUMP IN HEX
T - CONTROL STORE DUMP IN HEX
U - CONTROL WORD DUMP IN HEX
V - MAPPING MEMORY DUMP IN HEX
W - LSU DUMP IN HEX
(BS) PREVIOUS DISPLAY
CIP10

Figure 2-32. Dump to Printer Options for CYBER 994 Systems, Tape Deadstart

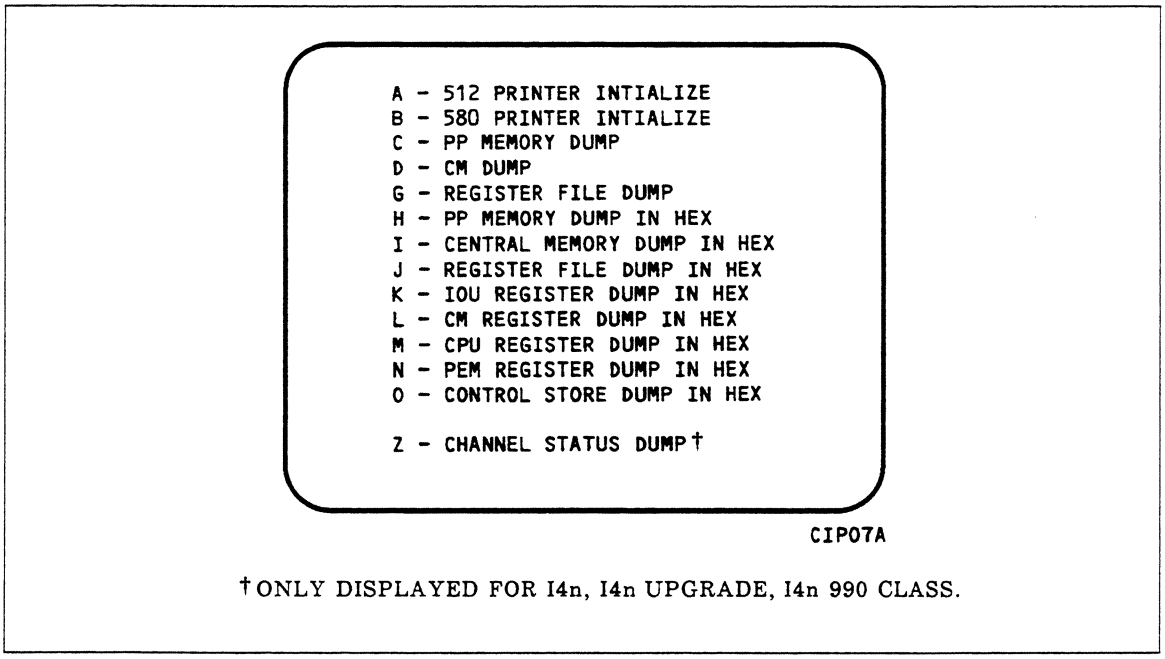

A - 512 PRINTER INTIALIZE
B - 580 PRINTER INTIALIZE
C - PP MEMORY DUMP
D - CM DUMP
G - REGISTER FILE DUMP
H - PP MEMORY DUMP IN HEX
I - CENTRAL MEMORY DUMP IN HEX
J - REGISTER FILE DUMP IN HEX
K - IOU REGISTER DUMP IN HEX
L - CM REGISTER DUMP IN HEX
M - CPU REGISTER DUMP IN HEX
N - PEM REGISTER DUMP IN HEX
O - CONTROL STORE DUMP IN HEX
Z - CHANNEL STATUS DUMP†
CIP07A
†ONLY DISPLAYED FOR I4n, I4n UPGRADE, I4n 990 CLASS.

Figure 2-33. Dump to Printer Options for CYBER 960 and 970 Systems, Tape Deadstart

Table 2-5. Keyboard Entries for a Printer Dump, Disk Deadstart

Entry	Function
A	512 PRINTER INITIALIZE. This option initializes the 512 printer image with the data necessary to print with a 512-1 print train.
B	580 PRINTER INITIALIZE. This option initializes the 580 printer buffer image and format buffer image memories.
C[1]	PP MEMORY DUMP. This option provides an octal dump to printer of 12-bit PP memories and 16-bit PP memories with their associated R, P, Q, K, and A register values.
D	CM DUMP. This option provides an octal dump to printer of a selected area of central memory.
E	PAGE MAP DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Page Map.
F	SEGMENT MAP DUMP IN HEX. This option provides a hexidecimal dump to the printer of the CPU Segment Map.
G	CACHE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Cache.
H	PP MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the PP memories. The associated P, Q, K, and A register values are also dumped.
I	CM DUMP IN HEX. This option provides a hexadecimal dump to the printer of a selected area of central memory.
J	REGISTER FILE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU register file contents.
J[2]	ERROR TAG MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Error Tag Memory contents.
K[1]	IOU REGISTER FILE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the IOU maintenance register contents. The CIO registers are also dumped, if installed.
L	CM REGISTER DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of the central memory maintenance registers.

1. On multiple IOU systems, only IOU0 is supported.

2. CYBER 994 only.

(Continued)

Table 2-5. Keyboard Entries for a Printer Dump, Disk Deadstart *(Continued)*

Entry	Function
M	CPU REGISTER DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of the CPU maintenance registers. Respond to the message CPU NO = by entering the number of the CPU for which registers are to be dumped. If microcode is not executing, the program dumps only the hardware maintenance registers. In place of the software registers, the following message appears on the printer dump: MICROCODE HUNG
N	PEM REGISTER DUMP IN HEX. This option provides a hexadecimal dump of the contents of the PEM registers.
N[1]	REGISTER UNIT DUMP IN HEX. This option provides a hexadecimal dump of the contents of the associated registers.
O	CONTROL STORE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of control store. Respond to the message CPU NO = by entering the number of the CPU for which control store is to be dumped.
O[1]	PEM REGISTER DUMP IN HEX. This option provides a hexadecimal dump of the contents of the PEM registers.
P	IBS DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU IBS contents.
Q	ACU DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU ACU contents.
R	BDP DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU BDP contents.
S	EPN DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU EPN contents.
T	CONTROL STORE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of control store followed by a dump of shadow memory, if available.
U[1]	CONTROL WORD DUMP IN HEX. This option provides a hexadecimal dump to the printer of CPU Control Word contents. **NOTE** For any of the CPU DUMP options respond to the message CPU NO = by entering the number of the CPU for which registers are to be dumped.

1. CYBER 994 only.

(Continued)

Table 2-5. Keyboard Entries for a Printer Dump, Disk Deadstart *(Continued)*

Entry	Function
V	MAPPING MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Mapping Memory control memory contents.
W	LSU DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU LSU control memory contents.
Z	CHANNEL STATUS DUMP. This option dumps the status of Parity Error Disable, Active, Full, Channel Flag, and Channel Error for NIO channels 00-31B and, if installed, CIO channels 00-11B. A "0" in the resulting output indicates the corresponding status flag is clear and a "1" indicates the status flag is set.

S - ALTERNATE DEADSTART

Select this option from the UTILITIES display to specify an alternate CIP tape unit or disk device from which to deadstart. The ALTERNATE DEADSTART display (figure 2-34) appears.

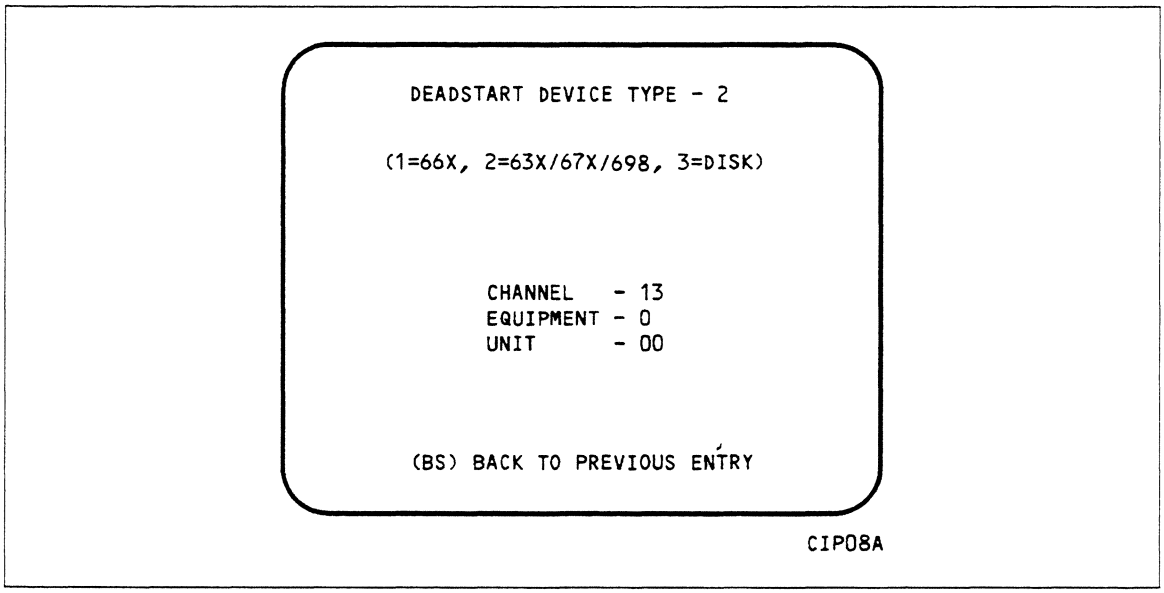


Figure 2-34. Alternate Deadstart

Enter the device type and press **Enter**. The system prompts you for channel, equipment, and unit numbers. Default values are provided for the device parameters. The values are those specified in the default parameter block. The default parameter block is defined through option D, DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS.

After the device information is entered, press **Enter** to deadstart from the alternate device.

NOTE

Alternate deadstart from operating system deadstart tapes is not supported; to load the operating system from a tape file, select option T, OPERATING SYSTEM FILE ON TAPE, from the OPERATOR INTERVENTION display.

L - DISPLAY CIP COMPONENT INFORMATION

Select this option from the UTILITIES display to display the release levels of the CIP components: microcode, EI, SCD, MDD, SCI, DFT, OS boot programs, and the valid and invalid status of the DEL, CFT, VCU, and MRT. An asterisk identifies components that have been installed manually.

M - DISK SUBSYSTEM MICROCODE LOAD

Select this option from the UTILITIES display to load peripheral microcode into the 844, 885, or 895 disk adapter and control module memory and install peripheral microcode onto specified drives. Refer to Loading and Installing Disk Subsystem Microcode From Tape in section 4 for procedures and additional information about this option.

I - INITIALIZE MAINFRAME

Select this option from the UTILITIES display to initialize the mainframe after power interruption or maintenance activity. The INITIAL OPTIONS display reappears with the following message on the bottom of the display:

```
ALL MAINFRAME MEMORIES WILL
BE INITIALIZED FOR MSL/OS LOADS
```

Mainframe initialization, including initialization of central memory, PP memory, and maintenance registers, occurs when you select this option and then perform either an operating system load on a level 0, 1, or 2 (not 3) deadstart or select the off-line maintenance option. Refer to Performing a Power-On Initialization in section 4 for procedures and additional information about this option.

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Deadstart Procedure Summaries 3

Deadstart is the process that makes the computer system operational and ready to process jobs. There are two deadstart procedures: coldstart and warmstart. Coldstart is the procedure used to deadstart the system when the tape or disk controllers do not have peripheral microcode loaded. Warmstart is the procedure used when peripheral microcode is loaded and executing correctly. The CIP installation procedures in section 2 are warmstart procedures.

In general, the procedure used most often to perform deadstarts is the warmstart. Warmstarting from mass storage, or a CDC 698 magnetic tape unit, is only possible after the disk controller or tape controller to be used has been loaded with the proper controlware and only if the peripheral microcode is functioning properly. Warmstarts are always possible from 677/679 magnetic tape units.

General Deadstart Procedures

Refer to figure 3-1 for a graphical representation of the general deadstart process. The general deadstart procedure for CYBER 960, 970, and CYBER 994 systems is as follows:

___ 1. Complete the following steps to bring up the CONSOLE MAIN MENU (figure 3-1).

___ a. Press **Ctrl-F2**.

___ b. The CONSOLE MAIN MENU appears.

If the CONSOLE MAIN MENU does not appear after pressing **Ctrl-F2**:

___ a. Press **Ctrl-Alt-Del**.

___ b. The CDC logo appears. Approximately 10 seconds thereafter, the CONSOLE MAIN MENU appears.

___ 2. If the appropriate deadstart program is selected,[1] type `S` or press **Enter**; the SYSTEM LOAD OPTIONS warning shown in figure 3-3 appears.

From the warning display, press **Enter** to proceed with the deadstart. Upon completion of the deadstart, the INITIAL OPTIONS display appears. Proceed with step 4.

___ 3. Perform one of the following steps from the CONSOLE MAIN MENU.

If you have a dual IOU system:

___ a. Type `M` to bring up the MAINTENANCE OPTIONS menu shown in figure 3-4.

___ b. Type `0` to bring up the MAINTENANCE OPTIONS - IOU0 display or 1 to bring up the MAINTENANCE OPTIONS - IOU1 display. Refer to figure 3-5.

---

1. The CONSOLE MAIN MENU indicates which deadstart program is currently selected via the line `PROGRAM n SELECTED`.

___ c. Enter or retrieve the appropriate deadstart program[2], then type S to execute a short deadstart. The INITIAL OPTIONS display appears.

If you have a single IOU system:

___ a. Type M to bring up the MAINTENANCE OPTIONS display. Refer to figure 3-5.

___ b. Enter or retrieve the appropriate deadstart program[3], then type S to execute a short deadstart. The INITIAL OPTIONS display appears.

___ 4. You may proceed to select appropriate options from the CTI displays.

Continue to initialize the operating system or to load MSL as described in the appropriate operating system operator's guide or MSL manuals.

2. Refer to Retrieving/Modifying the Deadstart Program, later in this section.

3. Refer to Retrieving/Modifying the Deadstart Program, later in this section.

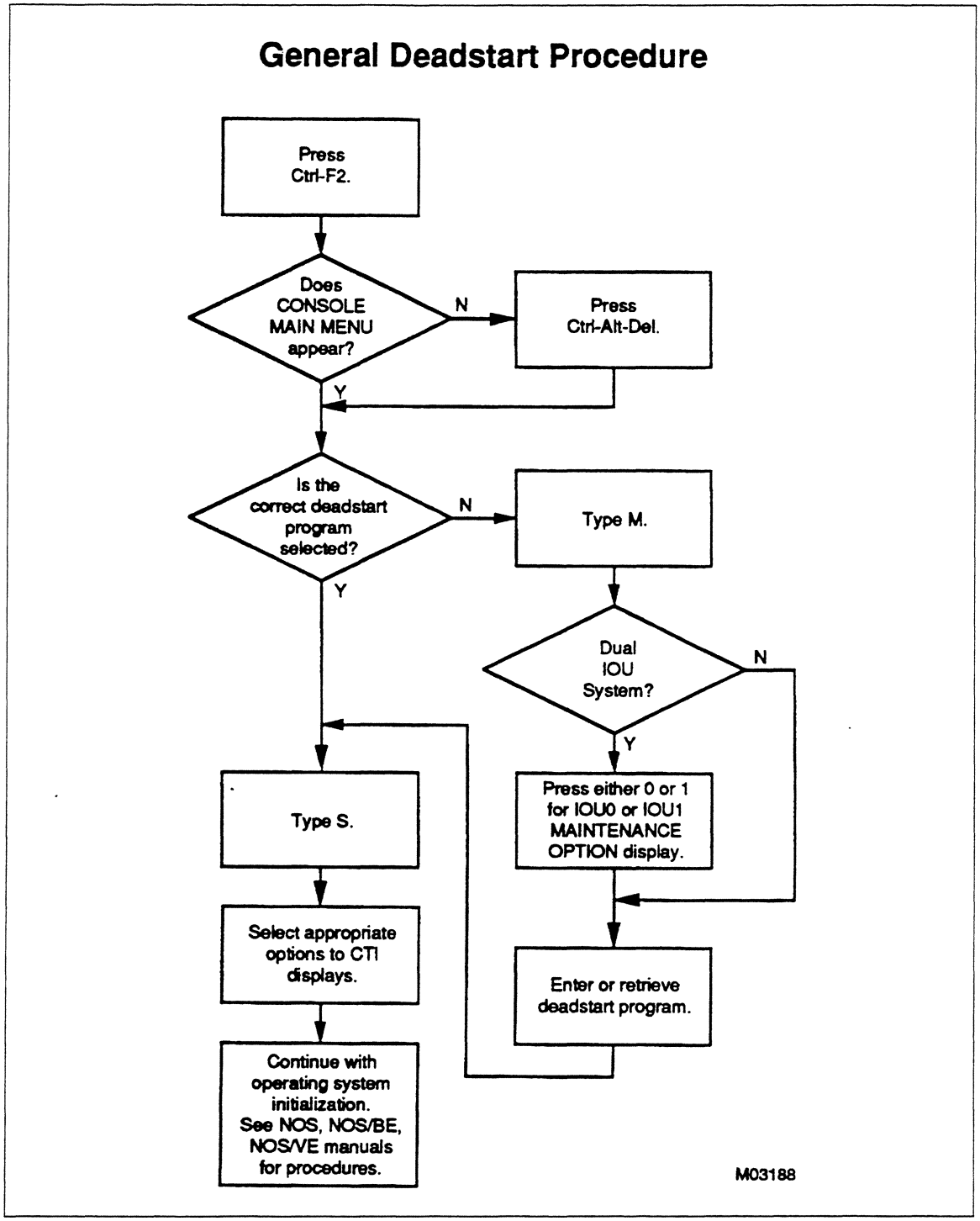

Figure 3-1. General Deadstart Procedure Flowchart

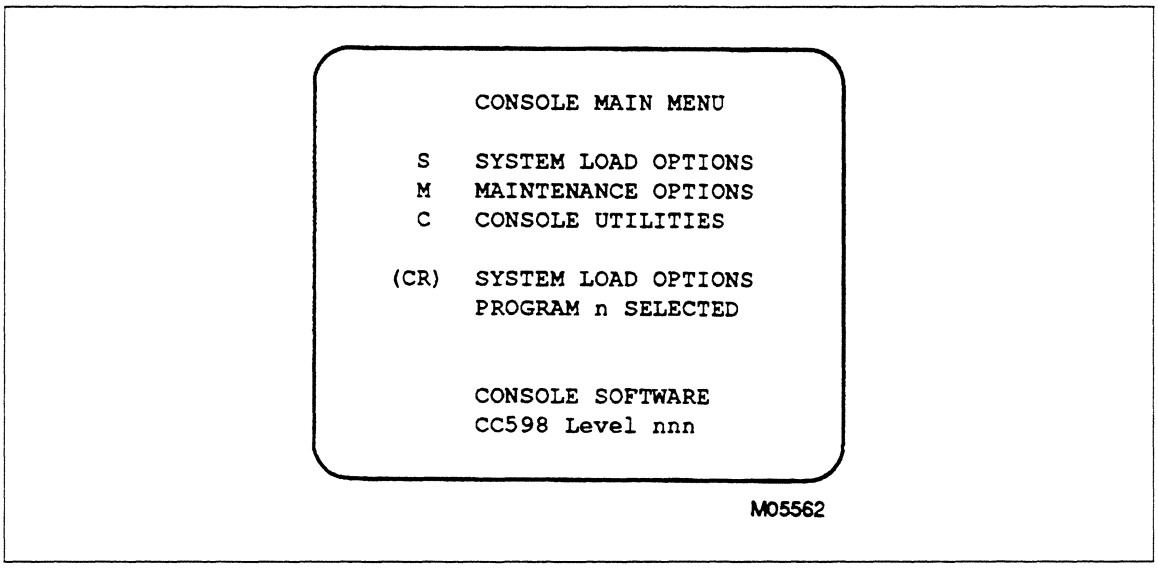

Figure 3-2. Console Main Menu

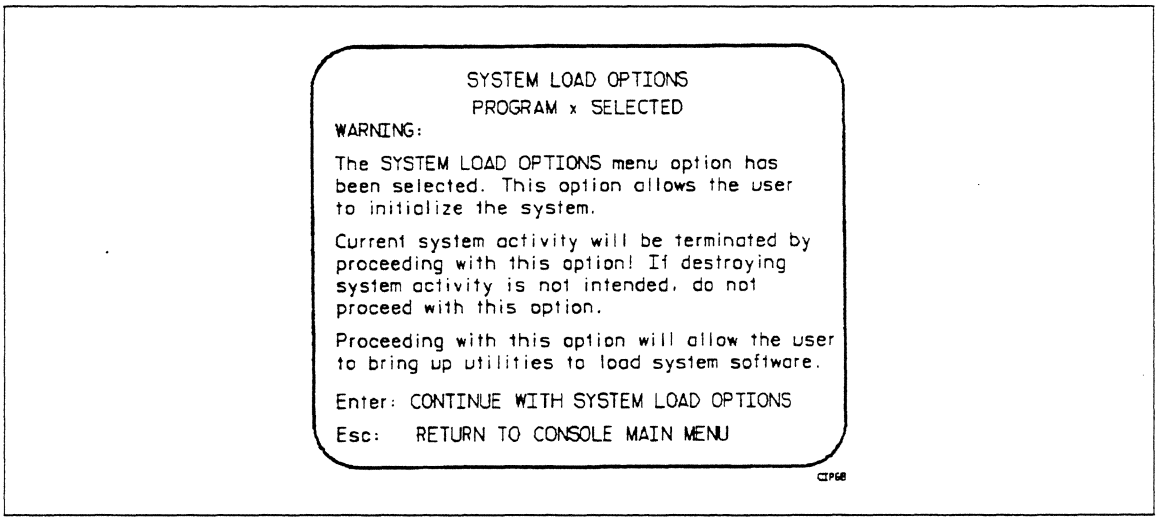
SYSTEM LOAD OPTIONS
PROGRAM x SELECTED
WARNING:
The SYSTEM LOAD OPTIONS menu option has been selected. This option allows the user to initialize the system.
Current system activity will be terminated by proceeding with this option! If destroying system activity is not intended, do not proceed with this option.
Proceeding with this option will allow the user to bring up utilities to load system software.
Enter: CONTINUE WITH SYSTEM LOAD OPTIONS
Esc: RETURN TO CONSOLE MAIN MENU
CIP68

Figure 3-3. System Load Options Warning

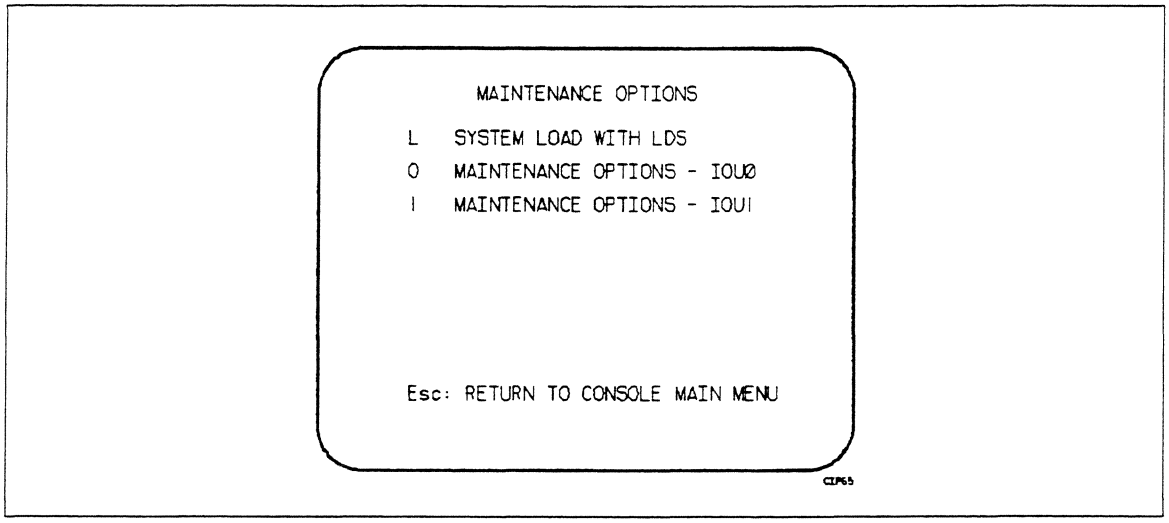
MAINTENANCE OPTIONS
L SYSTEM LOAD WITH LDS
0 MAINTENANCE OPTIONS - IOU0
1 MAINTENANCE OPTIONS - IOU1
Esc: RETURN TO CONSOLE MAIN MENU
CIP65

Figure 3-4. Maintenance Options Menu - Dual IOU

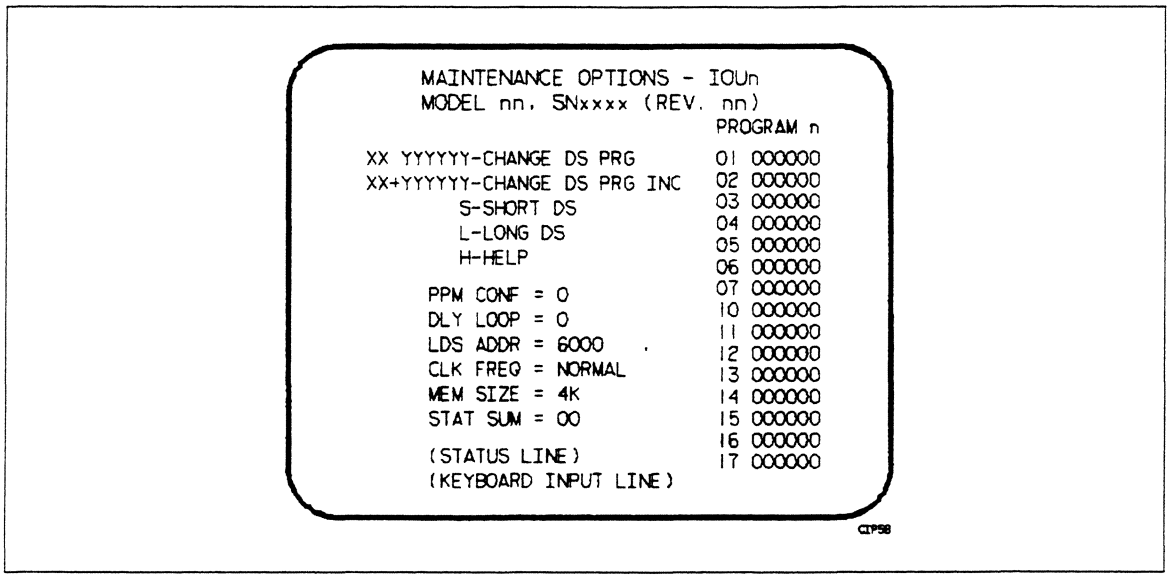

Figure 3-5. Maintenance Options - IOU0/IOU1 Display

Operating System Deadstart

An operating system deadstart can only be performed after CIP has been installed onto the CIP device. Operating system load from a tape file is supported through the CIP device deadstart process.

The operating system deadstart procedures require at least one disk unit and, when the operating system file is on tape, one tape unit. The procedures assume that peripheral microcode has been loaded into the peripheral controller(s). If the peripheral microcode is not loaded, refer to coldstart instructions later in this section.

OS Deadstart From CIP Device

This procedure assumes that:

- The deadstart program is set for deadstart from the CIP device.
- CIP has been installed onto the CIP device.

If the operating system file has also been installed onto the CIP device, a complete CIP device deadstart can be performed. Refer to the NOS 2 Analysis Handbook, INSTALL command, for the procedure to install the NOS deadstart file onto the CIP device. The NOS/BE level 0 deadstart process automatically installs the NOS/BE deadstart file on the CIP device for use on subsequent deadstarts. For NOS/VE standalone, refer to the NOS/VE Software Release Bulletin (SRB) for the procedure to install the NOS/VE deadstart file onto the CIP device.

Operating System File on CIP Device

The following procedure is to be used when the operating system (OS) file resides on the CIP device.

___ 1. Complete the following steps to bring up the CONSOLE MAIN MENU on your CC598-B/E.

___ a. Press **Ctrl-F2**.

___ b. The CONSOLE MAIN MENU appears.

If the CONSOLE MAIN MENU does not appear after pressing **Ctrl-F2**:

___ a. Press **Ctrl-Alt-Del**.

___ b. The CDC logo appears. Approximately 10 seconds thereafter, the CONSOLE MAIN MENU appears.

___ 2. From the CONSOLE MAIN MENU type `S` or press **Enter**. Because current system activity will be terminated by proceeding with the `S` option, the warning display shown in figure 3-3 appears. From this display, press **Enter** to proceed to the INITIAL OPTIONS display.

___ 3. From the INITIAL OPTIONS display, press **Enter** to select the default option, OS LOAD AUTOMATIC. This option assumes that the deadstart program is set correctly for deadstart level (0, 1, 2, 3) and for CMRDECK selection (NOS), or for CMR selection (NOS/BE), or for DCFILE selection (NOS/VE).

If the deadstart program is set correctly, the operating system deadstart is executed.

___ 4. If the deadstart program is not set correctly for these selections, type O to select the OS LOAD WITH INTERVENTION option. Operator intervention also allows execution of the hardware verification sequences (CYBER 994 only) and reconfiguration of mainframe hardware components. For specific information regarding operator intervention options, refer to Deadstart From CIP Device, Displays and Options, in section 2 of this manual.

Operating System File on Tape or Alternate Disk Unit

The following procedure is to be used when the operating system (OS) file resides on tape or an alternate disk unit.

___ 1. Complete the following steps to bring up the CONSOLE MAIN MENU on your CC598-B/E.

___ a. Press **Ctrl-F2**.

___ b. The CONSOLE MAIN MENU appears.

If the CONSOLE MAIN MENU does not appear after pressing **Ctrl-F2**:

___ a. Press **Ctrl-Alt-Del**.

___ b. The CDC logo appears. Approximately 10 seconds thereafter, the CONSOLE MAIN MENU appears.

___ 2. From the CONSOLE MAIN MENU type S or press **Enter**. Because current system activity will be terminated by proceeding with the S option, the warning display shown in figure 3-3 appears. From this display, press **Enter** to proceed to the INITIAL OPTIONS display.

___ 3. From the INITIAL OPTIONS display, type O to select the operator intervention option; the OPERATOR INTERVENTION display appears.

___ 4. If the deadstart program is not set correctly for deadstart level and for CMRDECK selection (NOS), CMR selection (NOS/BE), or DCFILE selection (NOS/VE), before proceeding, type P to select the DEADSTART PANEL PARAMETERS option. Operator intervention also allows execution of hardware verification sequences (CYBER 994) and reconfiguration of the mainframe hardware components. For specific information regarding operator intervention options, refer to Deadstart from CIP Device, Displays and Options, later in this section.

___ 5. Type S, SELECT DEADSTART DEVICE, from the OPERATOR INTERVENTION display to select tape or alternate disk deadstart.

To execute an OS deadstart from tape:

___ a. Type T.[4]

___ b. For NOS or NOS/BE deadstarts, enter the tape type, channel, equipment, and unit when prompted.

___ c. Messages will indicate that the operating system is loading programs and running tests.

To execute an OS deadstart from an alternate disk unit:

___ a. Type D.[5]

___ b. For NOS or NOS/BE deadstarts, enter the disk channel, equipment, and unit when prompted.

___ c. Messages will indicate that the operating system is loading programs and running tests.

4. For NOS/VE deadstarts, the operating system deadstart sequence is initiated when you type T. Reference the NOS/VE Operations Manual for more information on NOS/VE Deadstarts.

5. For NOS/VE deadstarts, the operating system deadstart sequence is initiated when you type D. Reference the NOS/VE Operations Manual for more information on NOS/VE Deadstarts.

Warmstart Summary

Warmstart is the deadstart procedure used when the controlware is loaded and functioning properly. Before you perform a warmstart, the following preliminary procedures might be required.

- Coldstart: Loads tape and disk peripheral microcode to their respective controllers.
- CIP installation to disk: Loads appropriate CIP modules (CTI, EI, HIVS/MSL, MDD, microcode, SCI, and SCD) to disk.

If a coldstart is required, you must perform the coldstart procedures before any other procedure. In some instances, coldstarts and warmstarts are combined into a single procedure. Detailed information concerning all phases of the deadstart process follows.

NOTE

Attempts to perform deadstarts from mass storage could be unsuccessful in configurations with shared access to controllers and drives. Conflicts can arise in both single and multiple mainframe configurations. In a multi-mainframe configuration, if one mainframe requires a controller or drive for its deadstart which a second mainframe has reserved, the deadstart is delayed momentarily until the reservation is released. In a single mainframe configuration, if a channel reserves a drive which is also required for a deadstart, the deadstart will fail. In this case, set the deadstart program for another channel.

The warmstarting steps given later in this section are the procedures necessary to perform a warmstart from an 844 disk unit, or from an 885-11/12 disk unit.

General Program Settings for a Warmstart

There are two types of warmstart programs: one for a deadstart device connected to a channel with a PP and the other for a deadstart device connected to a channel without a PP.

NOTE

When deadstarting from a 7154 disk controller, an incorrect warmstart program (that is, one containing incorrect channel or unit numbers) can hang the controller. To free the controller, correct the program and then master clear the controller by sequentially pressing the STOP, MASTER CLEAR, and GO buttons, which are located inside the controller chassis.

The deadstart device on which the deadstart tape or disk pack is mounted, its associated controller, and the channel used to access this equipment are identified by deadstart programs as illustrated in figures 3-6 and 3-7.

Program Word	Octal Instruction
1	1402
2	73cc
3	0017
4	75cc
5	77cc
6*	eddd
7	74cc
10	71cc
11	7301
12	000a
13	rpxx
14	0000
15	0000
16	0000
17	0000
20	7112

*For 7165 controller/895 drive, set word 6 to:
011 011 ssd ddd, where:
ss = storage director number
ddd = disk drive number

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Figure 3-6. Program Settings for Warmstarts from a Channel with a PP (For Example, Channel 1, 2, or 11)

The following descriptions of the deadstart program parameters refer to figure 3-6.

Parameter	Description
cc	Channel number used to access the deadstart equipment.
e	Controller equipment number to which the deadstart equipment is connected.
ddd	Equipment deadstart function; depends on device type as follows: 011 01u uuu — 677 tape units at 556 cpi. 001 01u uuu — 677 tape units at 800 cpi, 679, and 698 tape units. 011 000 uuu — 844 disk units. 011 10u uuu — 885 disk units. where u uuu (or uuu) represents the physical unit number on which the deadstart device is mounted.
a	Refer to Setting Word 12, later in this chapter.
rpxx	Refer to Setting Word 13, later in this chapter.

Program Word	Octal Instruction
1	0000
2	0000
3	0000
4*	75cc
5	77cc
6**	eddd
7	74cc
10	71cc
11	7301
12	000a
13	rpxx
14	0000
15	0000
16	0000
17	0000
20	0000

*If on channel 0, set word 4 bit representation to:
111 101 1cc ccc, where:
cc ccc = channel number.

**For 7165 controller/895 drive, set word 6 to:
011 011 ssd ddd, where:
ss = storage director number
ddd = disk drive number

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Figure 3-7. Program Settings for Warmstarts from a Channel without a PP

The following descriptions of the deadstart program parameters refer to figure 3-7.

Parameter	Description
cc	Channel number used to access the deadstart equipment.
e	Controller equipment number to which the deadstart equipment is connected.
ddd	Equipment deadstart function; depends on device type as follows: 011 01u uuu — 677 tape units at 556 cpi. 001 01u uuu — 677 tape units at 800 cpi, 679, and 698 tape units. 011 000 uuu — 844 disk units. 011 10u uuu — 885 disk units. where u uuu (or uuu) represents the physical unit number on which the deadstart device is mounted.
a	Refer to Setting Word 12, later in this chapter.
rpxx	Refer to Setting Word 13, later in this chapter.

Coldstart Summary

Coldstart procedures load tape and disk controllers with peripheral microcode. The manner in which controlware is loaded, however, depends on the type of controller a tape or disk unit utilizes.

The following pages contain equipment-specific coldstart procedures as follows:

- Coldstart/install of 844/885/895 disk subsystem microcode from a CIP tape.
- Coldstart/warmstart of 7155/7165 disk controllers from a disk unit.
- Coldstart of 698 tape units from a CIP tape.

The phrase "bring up the MAINTENANCE OPTIONS display" will be used throughout this subsection to reduce the written content of the deadstart procedures. You should perform the following steps when you are instructed to bring up the MAINTENANCE OPTIONS display.

___ 1. Complete the following steps to bring up the MAINTENANCE OPTIONS display.

___ a. Press **Ctrl-F2**.

___ b. The CONSOLE MAIN MENU appears.

If the CONSOLE MAIN MENU does not appear after pressing **Ctrl-F2**:

___ a. Press **Ctrl-Alt-Del**.

___ b. The CDC logo appears. Approximately 10 seconds thereafter, the CONSOLE MAIN MENU appears.

___ 2. Perform one of the following steps from the CONSOLE MAIN MENU.

If you have a dual IOU system:

___ a. Type `M` to bring up the MAINTENANCE OPTIONS menu shown in figure 3-4.

___ b. Type `0` to bring up the MAINTENANCE OPTIONS - IOU0 display. Refer to figure 3-5.

If you have a single IOU system:

___ a. Type `M` to bring up the MAINTENANCE OPTIONS - IOU0 display. Refer to figure 3-5.

Coldstart of Disk Controllers for 844, 885-11/12, or 895 Disk Units

A coldstart is necessary when deadstarting from 844, 885-11/12, or 895 disk units, if the controlware is not yet loaded into the controller. The coldstart procedure contains a special program which reads the disk controller peripheral microcode, loads the peripheral microcode onto the controller, and then loads the deadstart file.

If the MSL is available at your site, the procedure titled Coldstart of a 7155/7165 Disk Controller From a Disk Unit may be used to load the 7155 and 7165 disk controllers.

After any successful coldstart, you should immediately reset the deadstart program for a warmstart (refer to Setting the Deadstart Program for a Warmstart, later in this section). After the controlware is loaded and functioning properly, there is no reason to perform a coldstart again (provided the disk subsystem is operating correctly).

Coldstart/Install of 844/885/895 Disk Subsystem Microcode From a CIP Tape

A special utility provides the capability of loading disk subsystem microcode onto the specified disk drives (refer to Loading and Installing Disk Subsystem Microcode from Tape in chapter 4). This utility installs peripheral microcode onto 7155 (for 844 or 885 disk units) and 7165 (for 895 disk units) disk controllers.

Coldstart/Warmstart of 7155/7165 Disk Controller From a Disk Unit

If peripheral microcode is already loaded onto a disk unit,[6] use this procedure to perform a deadstart. The following steps summarize the procedures necessary to perform coldstarts from a disk unit. Use this as a checklist during coldstart.

___ 1. Ensure that all required mass storage devices have packs mounted and/or are available.

___ 2. Mount the deadstart disk unit (if using an 844 disk unit).

___ 3. Bring up the MAINTENANCE OPTIONS display.

___ 4. Ensure that the deadstart program is set for a coldstart from a disk unit (figures 3-8 and 3-9).[7]

___ 5. Coldstart the disk controller by typing S or L (short or long deadstart).

___ 6. Continue to initialize the operating system or to load MSL as described in the appropriate operating system operator's guide or MSL manuals.

---

6. For more information on loading controlware to the disk, contact a CE.

7. Refer to Retrieving/Modifying the Deadstart Program later in this section.

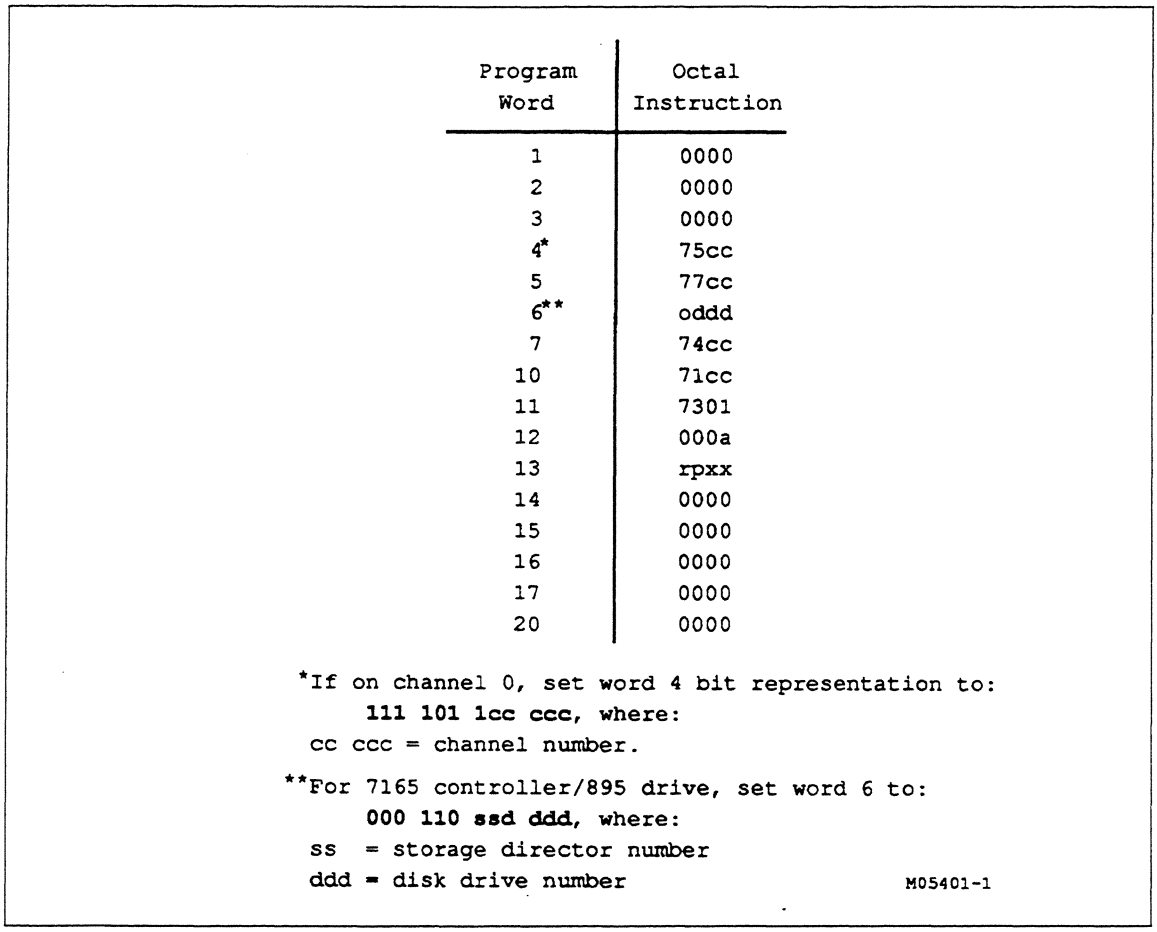
Program Settings for Coldstart/Warmstart of 7155/7165 Disk Controller From a Disk Unit

During coldstart from a disk unit, the deadstart program:

- Identifies the controller and channel number used to access the disk unit (from which the peripheral microcode is to be read).
- Specifies the controller, channel, and unit number of the drive on which the deadstart disk is mounted.
- Reads the peripheral microcode (this peripheral microcode loads the disk controller).
- Processes the deadstart file according to the options specified on the deadstart panel.

By entering the deadstart program shown in figures 3-8 and 3-9, you identify all the devices necessary for a deadstart. This includes the channel number and controller associated with the disk unit and the channel, controller, and unit number of the drive.

The disk unit must be on a channel without a PP (for example, channel 12 or 13). If the disk subsystem is functioning properly, there is no need to perform another coldstart after an initial loading of the peripheral microcode, and you should immediately reset the deadstart panel for a warmstart.



Program Word	Octal Instruction
1	0000
2	0000
3	0000
4*	75cc
5	77cc
6**	oddd
7	74cc
10	71cc
11	7301
12	000a
13	rpxx
14	0000
15	0000
16	0000
17	0000
20	0000

*If on channel 0, set word 4 bit representation to:
111 101 1cc ccc, where:
cc ccc = channel number.
**For 7165 controller/895 drive, set word 6 to:
000 110 ssd ddd, where:
ss = storage director number
ddd = disk drive number
M05401-1

Figure 3-8. Coldstart/Warmstart of 7155/7165 Disk Controller From Disk Unit on Channel 0, or With No PP on Disk Channel

The following descriptions of the deadstart program parameters refer to figure 3-8.

Parameter	Description
cc	Channel number used to access the deadstart disk equipment.
ddd	Equipment deadstart function; depends on device type as follows: 001 000 uuu 844 disk units. 001 10u uuu 885 disk units. where u uuu (or uuu) represents the physical unit number on which the deadstart device is mounted.
a	Refer to Setting Word 12, later in this chapter.
rpxx	Refer to Setting Word 13, later in this chapter.

Program Word	Octal Instruction
1	1402
2	73cc
3	0017
4	75cc
5	77cc
6*	oddd
7	74cc
10	71cc
11	7301
12	000a
13	rpxx
14	0000
15	0000
16	0000
17	0000
20	7112

*For 7165 controller/895 drive, set word 6 to:
000 110 ssd ddd, where:
ss = storage director number
ddd = disk drive number

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Figure 3-9. Coldstart/Warmstart of 7155/7165 Disk Controller From a Disk Unit, With a PP on Disk Channel

The following descriptions of the deadstart program parameters refer to figure 3-9.

Parameter	Description
cc	Channel number used to access the deadstart disk equipment.
ddd	Equipment deadstart function; depends on device type as follows: 001 000 uuu 844 disk units. 001 10u uuu 885 disk units. where u uuu (or uuu) represents the physical unit number on which the deadstart device is mounted.
a	Refer to Setting Word 12, later in this chapter.
rpxx	Refer to Setting Word 13, later in this chapter.

Coldstart of 698 Tape Units From Tape

A coldstart loads peripheral microcode (controlware) from the CIP tape into the CYBER Channel Coupler (CCC). Once the tape unit has been coldstarted, the warmstart procedure, described previously, should be followed. Use the following procedure to coldstart a 698 CYBER Magnetic Tape Unit (CMTS).

This procedure is to be used when mainframe power has been turned off and the subsequent deadstart is to be performed from a tape unit.

___ 1. Apply power to the system and to the 698 tape unit.

___ 2. Mount the CIP tape on the tape unit.

___ 3. Ensure that the tape unit is placed on line.

___ 4. Bring up the MAINTENANCE OPTIONS display.

___ 5. Ensure that the deadstart program is set for a coldstart from a tape unit (figures 3-10 and 3-11).[8]

___ 6. Type `S` to coldstart the tape unit; the message `SYSTEM INITIALIZATION IN PROGRESS` appears.

NOTE

If the tape does not move or if it fails to rewind after moving forward, refer to the troubleshooting section of the 698 CYBER Magnetic Tape Subsystem (CMTS) User's Guide listed in About This Manual.

8. Refer to Retrieving/Modifying the Deadstart Program later in this section.

Deadstart Program for Coldstart of 698-xx Tape Unit From Tape on a Channel with a PP

Use one of the programs shown in figures 3-10 and 3-11 when coldstarting a 698-xx tape unit. Refer to the table following each figure for a description of program parameters.

Program Word	Octal Instruction
1	1402
2	73cc
3	0017
4	75cc
5	77cc
6	060u
7	0300
10	0000
11	0000
12	0000
13	0000
14	0000
15	0000
16	0000
17	0000
20	7112

Figure 3-10. Coldstart of 698 Tape Units From Tape on a Channel With a PP

The following description of the deadstart program parameters refer to figure 3-10.

Parameter	Description
cc	Channel number used to access tape unit.
u	Tape unit number (o through 3)

Program Word	Octal Instruction
1	0000
2	0000
3	0000
4	75cc
5	77cc
6	060u
7	0300
10	0000
11	0000
12	0000
13	0000
14	0000
15	0000
16	0000
17	0000
20	0000

Figure 3-11. Coldstart of 698 Tape Units From Tape on a Channel Without a PP

The following descriptions of the deadstart program parameters refer to figure 3-11.

Parameter	Description
cc	Channel number used to access tape unit.
u	Tape unit number (o through 3)

Retrieving/Modifying the Deadstart Program

The procedures which follow describe how to retrieve, modify, or store a deadstart program. Deadstart programs are entered as octal numbers on your console keyboard. These procedures must be executed from the MAINTENANCE OPTIONS display shown in 3-3.

___ 1. If you have a single IOU system:

___ a. Type M to bring up the MAINTENANCE OPTIONS display shown in figure 3-3.

___ b. From the MAINTENANCE OPTIONS display, retrieve/modify the deadstart program as described in step 3. Skip to step 3.

___ 2. If you have a dual IOU system:

___ a. Type M to bring up the MAINTENANCE OPTIONS menu shown in figure 3-2.

___ b. Type 0 to bring up the MAINTENANCE OPTIONS - IOU0 display shown in figure 3-3.

___ c. From the MAINTENANCE OPTIONS - IOU0 display, retrieve/modify the deadstart program as described in the following paragraphs.

___ 3. Retrieve the desired deadstart program from the microprocessor by typing:

```
GP n
```

where n (0 through 3) is the number of the desired program. You can change individual instructions in a program, such as a unit number or other parameters, as described in following paragraphs. These changes are not retained across deadstarts unless this new program or a modified program is stored as described later in this section.

You can use the space bar to cycle through the stored programs. If the correct deadstart program is not stored or if a new program is to be entered and stored, the program must be entered as octal numbers through your console keyboard.

You can also change the warmstart program (represented by the bits shown in the related deadstart program figure) for your configuration by typing:

```
xx yyyyyy (or xx.yyyyyy, or xx.yyyyyy)
```

where xx is octal row number of the deadstart instruction and yyyyyy is the octal number equivalent to the actual instruction.

When you enter a six-digit instruction, the first two digits of the instruction must be zeros. Leading zeros in both the octal row number and the instruction, however, need not be entered. For example, if the row number was 03 and the instruction was 000017 you could type:

```
3 17
```

and get the same setting as typing:

```
03 000017.
```

If you want the system to automatically increment the octal row number, the entry after which the increment is to occur is:

```
xx+yyyyyy.
```

The + character indicates that the system is to automatically increment the octal row number. When the automatic increment is in effect, the system displays the next location after accepting the previous entry. Only the next instruction need be entered.

To cancel the automatic incrementing, press the left blank (erase) key after the octal row number appears.

To store a new program or a modified program, type:

```
SP n
```

where n (0 through 3) is the number of the program to be stored. If a program is already stored at the specified number, the new program replaces it.

After entering or retrieving the desired deadstart program, type:

```
S
```

and then press **Enter** for a short deadstart sequence, or type:

```
L
```

and then press **Enter** for a long deadstart sequence.

When system power is applied to your mainframe, the microprocessor can automatically retrieve the deadstart program, which has been stored as program number 3, and initiate a long deadstart sequence. If you want this automated feature, store the deadstart program for your configuration as program number 3. If you do not want this feature, store the first word of program 3 as 000300. This instruction places the PP0 resident program into a loop. Consequently, no deadstart activity occurs and no displays appear on the screen, rather, you must enter **Ctrl-F2** to bring up the CONSOLE MAIN MENU display. You may then proceed to retrieve or enter the desired warmstart program and select a short or long deadstart sequence.

Setting Word 12

The binary representation of word 12 is shown in figure 3-12. Enter word 12 as octal values through your system console keyboard.

```
000 000 000 cfa
```

Figure 3-12. Setting Word 12 Fields

Setting	Description
c	Parameter does not apply; set to 0.
f	If set, specifies that CTI does not initialize the alternate PP when the M (maintenance) option has been selected. **NOTE** When you are coldstarting a tape or disk controller from a card reader, bit f is also used as part of the channel number of the card reader. Thus, the channel number of the card reader controls whether the EDS occurs when you type L after loading the warmstart program. If the channel number is an odd number (the 2^0 bit is set), the EDS takes place. If the channel number is an even number (the 2^0 bit is not set), the EDS does not take place.
a	Specifies the EXTENDED DEADSTART SEQUENCE option. If you set this bit and type L after entering or retrieving the warmstart program, the system loads and executes the extended deadstart sequence (EDS). If you do not set this bit or if you type S after entering or retrieving the warmstart program, the EDS does not occur. When this bit is set, parts of PP memories are destroyed. Refer to Performing an Express Deadstart Dump in chapter 4 for more information.

The alternate PP does not access central memory. CTI does, however, restore the portion of central memory that it uses prior to hand-off, but the CPU exchange packages will not be valid.

Setting Word 13

Three unique fields exist in word 13 of the deadstart program which allow you to select the CMRDECK, the deadstart parameters, and the level of deadstart. Word 13 parameters shown in figure 3-13, are entered as octal values through your console keyboard.

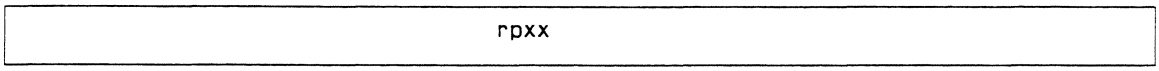

Figure 3-13. Word 13

Setting	Description
r	Specifies the level of deadstart (not used by NOS/VE).
p	Specifies the deadstart parameters.
xx	Specifies the CMRDECK number (NOS), CMR number (NOS/BE) or DCFILE number (NOS/VE).

Selecting the Deadstart Level (NOS)

You can select one of four levels of deadstarts by setting the appropriate value in the R field.

Value of r	Description
0	Indicates an initial or level 0 deadstart, during which the system is loaded from the deadstart file. This is not considered a recovery deadstart, although permanent files, queued files, and system dayfiles are recovered automatically (unless those file types are initialized by the EQPDECK entry, INITIALIZE). If queued files are recovered, they are inactive (refer to the QREC utility in the NOS 2 Analysis Handbook for more information). Furthermore, an attempt to recover these files is initiated by all levels of system deadstarts. A level 0 deadstart is normally specified: • For the first deadstart following a period in which the system was either inoperative or used for purposes other than NOS operations. • When a system malfunction occurred and other levels of system deadstarts prove ineffective. If it is necessary to redeadstart the system (for example, due to system malfunction), it is recommended that you attempt a level 3 recovery deadstart. If you select level 0, the system is reloaded from the deadstart file.
1	Indicates a level 1 recovery deadstart, during which the system, all jobs, and all active files are recovered from checkpoint information on mass storage. Permanent files are also recovered during a level 1 deadstart. You can perform a level 1 deadstart, however, only if the DSD command CHECK POINT SYSTEM (refer to the NOS 2 Operations Handbook) is successfully executed at a point immediately prior to the deadstart. **WARNING** A level 1 deadstart does not work if the contents of the extended memory are destroyed. Central memory and extended memory are not destroyed unless the V option is selected from the Operator Intervention display (refer to the Operator Intervention display in section 2 of this manual). Normally you use a level 1 recovery deadstart to allow maintenance to be performed and then to resume normal processing. It is also useful in system test situations. Never use a level 1 recovery deadstart in an attempt to recover from a system malfunction or to preserve queue files.

Value of r	Description
2	Indicates a level 2 recovery deadstart, during which all jobs and active files are recovered from checkpoint information on mass storage. No attempt is made to recover the system after a level 2 deadstart. Instead, the system is loaded from the deadstart file as in a level 0 deadstart. In all other respects, a level 2 recovery deadstart is identical to that described for a level 1 recovery deadstart. Central memory and extended memory are not destroyed unless the V option is selected from the Operator Intervention display (refer to the Operator Intervention display in section 2 of this manual). Normally you use a level 2 recovery deadstart in system test situations; it is not recommended for the normal production environment.
3	Indicates a level 3 recovery deadstart, during which all jobs, active files, and the system (with the exception of the library directory) are recovered from central memory tables. A level 3 deadstart is the only level that preserves the contents of central memory. If a deadstart level less than 3 is selected early in the deadstart process, a memory test pattern is written throughout central memory. To avoid inadvertent destruction of central memory contents when a level 3 deadstart is intended, it is recommended that you always specify level 3 in your deadstart program. If you need a deadstart level other than 3, you can specify the level by changing the DEADSTART PARAMETERS display. In a level 3 deadstart, the library directory is recovered from mass storage and permanent files are also recovered. A CHECKPOINT SYSTEM command, however, must be issued prior to a deadstart in order to prevent loss of SYSEDIT (system library modification) information. Only PP memory confidence testing occurs during a level 3 recovery deadstart; central memory is unaffected. Normally you perform a level 3 recovery deadstart following an equipment malfunction (for example, channel or PP hung), providing central memory and mass storage remain intact. Unless you can determine that the central memory is no longer reliable, you should attempt a level 3 recovery following a malfunction. If level 3 recovery fails, you must perform a level 0 deadstart. **CAUTION** Attempting a level 1 or 2 recovery deadstart after a level 3 deadstart fails does not correctly recover system activity and can endanger system and permanent file integrity. You must perform only a level 0 deadstart following a failed level 3 deadstart.

For additional information concerning levels of deadstart, refer to the NOS 2 Operations Handbook.

Selecting the Deadstart Level (NOS/BE)

You can select one of four levels of deadstarts by setting the appropriate value in the R field.

Value of r	Description
0	Indicates an initial or level 0 deadstart, during which the system loads the deadstart file from tape to CIP device before setting up the CMR libraries and directory. If CTI has been installed on a member of the system set that is turned on, you can perform an RMS deadstart on subsequent deadstarts. An RMS deadstart is not possible if the following message appears at postdeadstart. `FUTURE RMS D/S NOT POSSIBLE` For additional information about this message, refer to Entering Date and Time in the NOS/BE Operator's Guide. Upon successful completion of a level 0 deadstart, you do not need to perform any further level 0 deadstarts.
1	Indicates a level 1 recovery deadstart, which sets the CMR libraries and directory from the deadstart file on CIP device. You normally specify a level 1 deadstart when: • NOS/BE is being deadstarted after some other system has been using the mainframe. • A system malfunction has occurred and a level 3 deadstart proves ineffective. This level is the lowest level of deadstart which can use an RMS device as the CIP device.

Value of r	Description
2	Indicates a level 2 recovery deadstart, during which all jobs and active files are recovered from a checkpoint file on RMS. You can do a level 2 deadstart only if the DSD command CHECKPOINT was successfully processed earlier. Extended memory contents are not saved when the system automatically enters IDLE mode. At level 627 of NOS/BE, the contents of extended memory are saved if the DSD command CHECKPOINT is entered by the operator. You normally use a level 2 deadstart to perform maintenance and then resume to normal processing. Although a level 2 deadstart is useful in system test situations, it should never be used to attempt recovery from a system malfunction.
3	Indicates a level 3 recovery deadstart, which recovers the system (including all jobs and active files from central memory tables). A level 3 deadstart is the only level that preserves the contents of central memory. If any deadstart level less than 3 is selected early in the deadstart process, a memory test pattern is written throughout central memory. To avoid inadvertent destruction of central memory contents when a level 3 deadstart is intended, it is recommended that you always specify level 3 in your deadstart program. If you need a deadstart level other than 3, you can specify the level by changing the DEADSTART PARAMETERS display. Normally you would perform a level 3 recovery deadstart following an equipment malfunction (for example, channel or PP hung), provided that the central memory, mass storage devices, and the extended memory remain intact. Unless you can determine that CMR, central memory, or RMS tables are not intact, or if a level 3 recovery fails, you must perform a level 1 deadstart. If the tables on the system set are inaccurate, perform a level 0 deadstart. **NOTE** Level 0 is the only level that deadstarts exclusively from tape. In all other levels, the system can be deadstarted either from tape or CIP device (depending on the device selected by the deadstart panel settings). If the deadstart device is a tape unit, any level deadstart can be performed after the warning `FUTURE RMS D/S NOT POSSIBLE` appears at post-deadstart time.

For additional information concerning levels of deadstart, refer to the NOS/BE Operator's Guide.

Selecting the Deadstart Parameters

You can select deadstart parameters to control miscellaneous deadstart functions by setting the P field in word 13. The binary representation of these parameters is shown in the shaded area of figure 3-14.

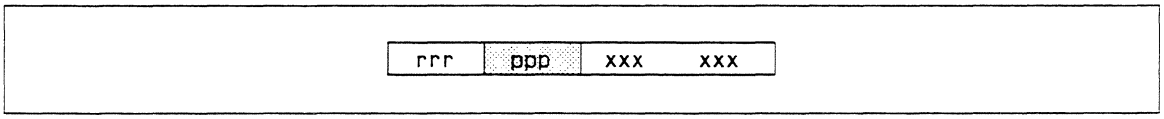

Figure 3-14. Word 13, Deadstart Parameters

Setting	Description
ppp	Specifies miscellaneous deadstart functions. Refer to table 3-1.

Table 3-1. Word 13 P Field Settings

Bit Number	Bit State	Description
8	0	Reserved for future use.
7	0	Reserved for future use.
6	0	For NOS, indicates that the CMRDECK or the level option display is not displayed during deadstart. For NOS/VE, indicates that no operator pause is to occur during deadstart. Not used for NOS/BE.
6	1	For NOS, indicates that the CMRDECK is displayed during levels 0, 1, and 2 deadstarts. Level 3 options are displayed on a level 3 deadstart. For NOS/VE, indicates that operator pause is to occur during a deadstart. Not used for NOS/BE.

Selecting the CMRDECK (NOS)

The CMRDECK defines the table sizes and other information to be used for system operations. Up to 64 CMRDECKs (numbered 0 through 77_8) can be included on the deadstart file.

NOTE

You can select the CMRDECK only during a level 0 (initial) deadstart. For a level 1 or 2 (recovery) deadstart, you must use the CMRDECK selected during the most recent level 0 deadstart. Refer to Selecting the Deadstart Level for NOS or for NOS/BE earlier in this section for information concerning the levels of deadstart.

The number of the selected CMRDECK is indicated by setting the xx field of word 13.

Setting	Description
xx	Specifies the CMRDECK number (0 through 77_8) to be used.

For example, if CMRDECK number 26_8 is selected, the corresponding word 13 octal setting would be as follows:

```
rp26
```

You can also specify the CMRDECK from the console keyboard by using the DEADSTART PARAMETERS display. Values entered from the DEADSTART PARAMETERS display take precedence over those specified in the deadstart program. For example, the xx field of word 13 in your deadstart program may be set to select the CMRDECK most frequently used by an installation, a different CMRDECK could be selected by using the DEADSTART PARAMETERS display during a level 0 deadstart.

Selecting the CMR (NOS/BE)

The CMR defines the equipment configuration to be used for system operations. Up to 64 CMRs (numbered 0 through 77_8) can be included on the deadstart file (numbered 0 through 77_8). This provides an installation with the ability to select one of several equipment configurations when the system is deadstarted.

NOTE

You can select the CMR during a level 0 or level 1 deadstart. If it is necessary to perform a level 2 or level 3 deadstart, you must use the CMR number that was running at the time of the checkpoint (for a level 2 deadstart) or system malfunction (for a level 3 deadstart). Refer to Selecting the Deadstart Level for either NOS or NOS/BE, earlier in this section, for information concerning levels of deadstart.

The number of the CMR to be used is selected by setting the xx field.

Setting	Description
xx	Specifies the CMR number (0 through 77_8) to be used.

For example, assume that CMR number 26_8 is to be used to define the equipment configuration at deadstart. In this case, the corresponding word 13 octal setting would be as follows:

```
rp26
```

It is not necessary to specify the CMR in the deadstart program. In this case, you can also specify the CMRDECK from the console keyboard by using the DEADSTART PARAMETERS display. Values entered from the DEADSTART PARAMETERS display take precedence over those specified in the deadstart program. For example, the xx field of word 13 in the deadstart program could be set to select the CMR which is most frequently used by an installation. However, another CMR could be selected from the DEADSTART PARAMETERS display during a level 0 or level 1 deadstart.

Selecting the DCFILE Deck (NOS/VE Prior to L739)

The DCFILE deck contains some of the system core commands for NOS/VE. Up to 64 DCFILE decks (numbered 0 through 77_0) can be included on the deadstart file. The number of the DCFILE deck to be used is identified in the xx field of word 13.

Setting	Description
xx	Specifies the DCFILE deck number (0 through 77_0) to be used.

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General CIP Procedures 4

This chapter includes procedures that are generally independent of the computer system model. Notes with the procedures indicate when model types are significant.

Most of the procedures included here use several of the displays and options offered by CIP. The starting point of a procedure is generally a deadstart operation, or a major options display such as the INITIAL OPTIONS display, the UTILITIES display, the MANUAL OPERATIONS display, and so forth. Refer to section 2 for procedures on how to bring up a specific display.

For Better Performance

You may find it beneficial to remove the overview of displays (figures 2-1, 2-2, 2-20, and 2-21) from their binder and follow along with them as you execute deadstart procedures. This helps familiarize you with the progression and flow of deadstart displays.

NOTE

The options used to install CIP modules individually are provided for emergency CIP repair only.

Emergency CIP Repair

If a critical problem exists with one of the CIP modules, a correction to fix the problem may be required. Corrections are sent to the CE in the form of a new module, providing a critical PSR or critical TAR has been received from the site. Install the new module onto the CIP device to replace the module with the problem. Use the individual CIP module installation procedures described next.

NOTE

The new module is a temporary solution. Control Data will combine the corrected module with the other CIP modules to form a new CIP level. A new CIP tape is then sent out at the next release to replace the new module.

Emergency CIP repair considerations:

- Manual operations can only be executed from the CIP tape.
- When manual operations options are used to install microcode or EI, the system appends an asterisk to the module name. The asterisk denotes to support personnel that the module has been modified. You display the module name by selecting option L, DISPLAY CIP COMPONENT INFORMATION, from the UTILITIES display.
- Do not use the manual operations to mix components of different CIP levels; that is, do not install only the microcode from a new CIP.

Installing an Individual CIP Module

Install an individual CIP module using this procedure.

___ 1. Mount the current CIP tape on a tape drive.

___ 2. Mount the tape containing the new module on another tape drive.

___ 3. Set the deadstart program for a deadstart from the CIP tape.

___ 4. Execute the deadstart. The INITIAL OPTIONS display appears.

___ 5. Press **Enter** to select the BUILD DEADSTART DISK option. The BUILD DEADSTART DISK display appears.

___ 6. Type an **M** to select manual operations. The MANUAL OPERATIONS display appears.

___ 7. The next steps depend upon the type of module that was patched: EI, microcode, MSL, HIVS, or CTI. Use the following applicable procedure.

Replacing EI, Microcode, SCD, or MDD

___ 1. Type D while displaying the MANUAL OPERATIONS display to replace EI, microcode, SCD, MDD, DFT, DPB, or SCI.

___ 2. Enter:

___ a. The disk channel and unit number of the CIP device and press **Enter**, or

___ b. The tape type, channel, equipment, and unit numbers of the tape drive containing the new module tape and press **Enter**.

___ 3. Type B to replace microcode, C to replace EI, D to replace CC634B SCD, E to replace MDD, F to replace DFT, or H to replace SCI.

___ 4. The new module is installed to disk.

___ 5. Press **Ctrl-F2** to return to the CONSOLE MAIN MENU.

Replacing an MSL Module

___ 1. Type T while displaying the MANUAL OPERATIONS display to install MSL. The initial TDX display appears.

___ 2. Press **Enter**.

___ 3. Enter the channel and unit of the CIP device.

___ 4. Enter the device type, channel, equipment, and unit of the tape drive containing the new MSL module and press **Enter**. The TDX OPTIONS display appears.

___ 5. Type A to build MSL on disk from tape. The MSL INSTALLATION options appear.

___ 6. Type F to perform a full installation in MSL/OS shared disk mode. The system asks you if you want to save command buffers.

___ 7. Type Y to save command buffers or N to load command buffers from tape.

___ 8. Press **Enter** when TDX displays:

```
COPY FROM
-CR- = 1st NAME
```

___ 9. Press **Enter** when TDX displays:

```
COPY THRU
-CR- = LAST NAME
```

___ 10. Type Y if you want TDX to perform a write verify function when transferring the data, or N for no verification. MSL installation is complete when TDX displays the last cylinder, track, and sector used for the copy.

___ 11. Press **Ctrl-F2** to return to the CONSOLE MAIN MENU.

Replacing an HIVS Module (CYBER 994 Only)

___ 1. Type T while displaying the MANUAL OPERATIONS display to install HIVS (for sites without a maintenance contract).

___ 2. Enter the channel and unit of the CIP device.

___ 3. Enter the type, channel, equipment, and unit of the tape device containing the new HIVS module and press **Enter**.

When the message INSTALLATION COMPLETE appears, HIVS installation is complete.

___ 4. Press **Ctrl-F2** to return to the CONSOLE MAIN MENU.

Replacing a CTI Module

___ 1. Type C to install CTI. This warning message appears:

```
          *WARNING*
PERMANENT FILES MAY BE LOST
   IF CTI IS NOT ALREADY
 INSTALLED ON THIS DEVICE
     (CR) TO CONTINUE
```

___ 2. Press **Enter** to continue.

___ 3. Enter the channel and unit of the CIP device.

___ 4. Upon successful installation, the following message appears:

```
          INSTALL COMPLETE
(CR) TO PROCESS DIFFERENT DEVICE
```

___ 5. Press **Ctrl-F2** to return to the CONSOLE MAIN MENU.

CIP Utility Procedures

The procedures described next use one or more of the options offered on the UTILITIES display. The UTILITIES display may be accessed during either a deadstart from disk or deadstart from CIP tape operation.

Performing an Express Deadstart Dump

Express Deadstart Dump (EDD) is an option offered on the UTILITIES display. It dumps the contents of PP memories, central memory, extended memory, CPU hardware registers, status/control (S/C) registers, maintenance registers, processor control store, and tape and disk (except FSC) controlware to magnetic tape.

The default tape density is 800 cpi for seven-track 667/677 tapes and 1600 bpi for nine-track 669/679/698/5698 tapes. All tapes are written in S format and as one file.

If you want EDD dumps to reside on tapes with consistent volume accessibility (VOL1 field), owner identifier (VOL1 field), file accessiblitly (HDR1 filed), and implementation identifier (HDR1 field), you must prelabel the dump tapes. EDD processes perform the following steps.[1]

- When EDD recognizes a labelled tape (VOL1 and HDR1), during the dump (as the tape is being rewritten) it preserves the content of the first 80 characters of a standard VOL1 label.
- EDD forces the HDR1 fields file accessibility and implementation identifier to the same value on all reels of a multireel dump. Since the values assigned to subsequent reels are determined by the values written for the first reel, if the first reel is not labelled, EDD places its own values in these fields.

NOTE

EDD dumps unified extended memory (UEM) for your computer system.

When EDD dumps PP memories, it destroys some of the contents of the PPs. Also, the long deadstart sequence and the UEM destroy parts of PP memories. If you select EDD after selecting one of these deadstart sequences, some of the information dumped is not valid. The amount of information destroyed depends on whether EDD was preceded by a short deadstart or long deadstart sequence and the setting of bit 2^0 in word 12 of the deadstart program. Table 4-1 shows the effect of EDD.

1. Refer also to steps 17 and 18 in EDD Dump Procedure, later in this chapter.

Table 4-1. Locations Affected by EDD

PP	Short Deadstart Sequence	Long Deadstart or Long Deadstart with EDS
PP0	All memory destroyed.	All memory destroyed.
PP1 through PP4	No loss.	All memory destroyed.
All other PPs	No loss.	No loss.

If you deadstart from a channel of an active PP, that PP loses the contents in locations 0 and 1.

PP0 Dump Procedure

For all systems, if you want to dump the entire contents of PP0, you must reconfigure the PPs to deadstart from another PP or transfer the contents of PP0 to another PP before using EDD. When possible, reconfigure PPs (refer to appendix F). If you cannot reconfigure PPs, transfer the contents of PP0 to another PP prior to the dump as follows:

___ 1. Choose a channel of an active PP to which the system can transfer the contents of PP0.

___ 2. Enter the following deadstart program.

Program Word	Octal Instruction
1	2000
2	7776
3	73pp
4	0000
5	0300

pp is number of the PP you chose to hold contents of PP0.

___ 3. Execute a short deadstart to run the program described in step 2. The system transfers contents of PP0 to the PP you selected. Contents of that PP are destroyed by the transfer.

___ 4. Reset the deadstart program for the appropriate warmstart.

NOTE

If you have reconfigured PPs or transferred the contents of PP0, you must execute another deadstart before using EDD. Remember which PP has the contents of PP0, such that when the system dumps PPs, you know which PP to print in order to get the contents of PP0.

EDD Dump Procedure

The following EDD procedure assumes that a dump tape has been mounted on the tape unit and that the tape unit is ready. This procedure also assumes you have deadstarted the system and have selected the UTILITIES display.

___ 1. Type E to start the dump process. The console displays:

```
EXPRESS DUMP DEVICE TYPE - m

1=667, 669              (800 BPI)
2=667                   (800 BPI)
  639, 679, 698, 5698  (1600 BPI)
3=639, 679, 698, 5698  (6250 BPI)
```

The value m is the device type specified in the default parameter block of the CTI/CDA. If the parameter block is not present, zeros are displayed.

NOTE

If the dump tape is mounted on a drive that does not support the selected tape type/density, unexpected results may occur. In such a case, the EDD must be restarted. The integrity of some information obtained during the second dump is questionable.

___ 2. Press **Enter** to use the device type which is displayed or type 1, 2, or 3, and press **Enter** to specify an alternate device. The console displays:

```
EXPRESS DUMP DEVICE TYPE - m

CHANNEL-cc

(BS) - BACK TO PREVIOUS ENTRY.
```

The value cc is the channel specified in the default parameter block in the CTI/CDA. If the parameter block is not present, zeros are displayed.

NOTE

If an erroneous channel is entered, you will be prompted back to this display after executing step 4. A check is made to see if channel numbers are less than or equal to 33_8.

It is a configuration requirement that neither channels 0 nor 1 be used for an EDD dump. Although usage of these channels is not verified by EDD, an express deadstart dump may fail if either of these channels is used.

___ 3. Press **Enter** to use the channel which is displayed or key in the two-digit channel number of the tape unit on which data is to be dumped and press **Enter**. The console displays:

```
EXPRESS DUMP DEVICE TYPE - m

CHANNEL-cc

EQUIPMENT-e

(BS) - BACK TO PREVIOUS ENTRY.
```

The value e is the equipment number specified in the default parameter block in the CTI/CDA. If the default parameter block is not present, zeros are displayed.

___ 4. Press **Enter** to use the equipment number displayed or key in the equipment number and press **Enter**. The console displays:

```
EXPRESS DUMP DEVICE TYPE - m
CHANNEL-cc
EQUIPMENT-e
UNIT-uu
(BS) - BACK TO PREVIOUS ENTRY.
```

The value uu is the unit number specified in the default parameter block of the CTI/CDA. If the default parameter block is not present, zeros are displayed.

___ 5. Press **Enter** to use the unit number displayed or key in the two-digit unit number and press **Enter**. The console displays:

```
EXPRESS DUMP NUMBER = 00
```

___ 6. Press **Enter** to use the default dump number (00) or key in a different number and press **Enter**.

___ 7. If the system has difficulty obtaining a valid reading from the clock chip, EDD will request the current day's date via the following display.

```
ENTER DATE - 00/00/00

          (FORMAT YY/MM/DD)
          (SPACE - SKIP FOR CHANGES)
          (LEFT BLANK - ZERO ENTRY)

(BS) - BACK TO PREVIOUS ENTRY.
```

___ 8. The console next displays:

```
UNLOAD DUMP TAPE OPTION.

Y - UNLOAD TAPE AFTER DUMP.
N - REWIND TAPE AFTER DUMP.

(CR) - UNLOAD TAPE AFTER DUMP.
(BS) - BACK TO PREVIOUS ENTRY.
```

Type Y to have the dump tape unloaded after the dump is completed. Type N to have the tape rewound and ready when the dump is completed. The default is to have the tape unloaded.

___ 9. The following message appears on computer systems when the ESM prompt has been selected via the Default Parameter display:

NOTE

The ESM prompt should be selected only if access to extended memory is through the Low Speed Port.

The console displays:

```
          ECS/LCM/ESM DUMP OPTIONS

(CR) = DO NOT DUMP EXTENDED
MEMORY.

NNNN = NUMBER OF 10000B WORD
BLOCKS.

(BS) - BACK TO PREVIOUS ENTRY.

Status line
Keyboard input
```

This display indicates how much extended memory should be dumped. Keyboard input is shown on the keyboard input line.

Press **Enter** to skip this option, or enter the number of 10000_8 word blocks of extended memory and press **Enter** to dump extended memory.

If a nonzero value was specified in the previous display for the number of blocks of extended memory to dump and if the ESM prompt has been selected, the following display appears.

```
EXTENDED MEMORY CHANNEL

(CR) = NO EM CHANNEL.

00   = CHANNEL TO DUMP EM.

(BS) = BACK TO PREVIOUS ENTRY.
```

This display requests the channel number on which EDD is to dump ECS/ESM. If ESM is connected to a CIO channel, ESM cannot be dumped.

___ 10. The console next displays:

```
CONTROLWARE WILL BE DUMPED
FROM THE FOLLOWING CHANNELS

NONE (the channel numbers used are displayed here)

CONTROLWARE DUMP OPTIONS

DUMP  = CH
DUMP CONTROLWARE
FROM SPECIFIED CHANNELS.

CLEAR = CH
DO NOT DUMP CONTROLWARE
FROM SPECIFIED CHANNELS.

(CR)    PROCEED WITH DUMP.
(BS)  - BACK TO PREVIOUS ENTRY.
Status line
Keyboard line
```

Channel numbers are added to this display as they are selected to be dumped.

NOTE

CIO channels can not be dumped.

The following controllers have dumpable controlware and are supported by EDD.

Controller Product Number	Controller Name
7021-1x	66X Tape
7154/55	844 Disk, 885 Disk
7165(CCC)	895 Disk

Channels that are not connected to one of the above controllers should NOT be specified to be dumped by EDD, as EDD may hang in trying to dump controlware from channels that have unknown equipment. This would prevent EDD from writing the end-of-tape marks at the end of the dump, and make the dump useless for later analysis.

NOTE

The tape controller 7021-1x does allow for the dumping of buffer controlware by EDD, but the controllers 7021-2x and 7021-4x do not.

___ 11. Type D, the channel number, and press **Enter** for each channel that controlware is to be dumped from. The system completes entry of the word DUMP and inserts the equal sign for you. The channel numbers are added to the list of channels to be dumped.

___ 12. Type C, the channel number, and press **Enter** to remove a channel from the list of channels to be dumped. The system completes the word CLEAR and inserts an equal sign for you.

The default is no controlware will be dumped.

___ 13. Type the appropriate response to the memory dump option display. If logical central memory size greater than 64MB, the following memory dump options appear (the first three lines will appear only if standalone NOS/VE was active):

```
ALL CENTRAL MEMORY ASSIGNED TO
170-STATE (IF ANY) WILL BE
DUMPED TO TAPE.[2]

SELECT THE OPTION TO DUMP CENTRAL
MEMORY ASSIGNED TO 180-STATE.

DUMP THE FOLLOWING -

  1)  ALL 180-STATE MEMORY.
  2)  NO 180-STATE MEMORY
  3)  ONLY CRITICAL 180-STATE MEMORY.

 CR)  ONLY CRITICAL 180-STATE MEMORY.
```

If logical central memory size is less than or equal to 64MB, or if a critical memory dump is not available for other reasons (i.e. system execution is too early in the deadstart), ONLY CRITICAL 180-STATE MEMORY does not appear and the default option (CR option) is ALL 180-STATE MEMORY.

Option	Description
1	EDD will write all of CM to the dump tape as a single record.
2	EDD will write only the 170-state memory to the dump tape.
3	(Option available only if CM>64MB.) EDD will write entire 170-state memory (if any) to the dump tape as a single record, then will dump only the portions of 180-state memory deemed necessary for system analysis of the interrupt.

2. This portion of the header will not appear if standalone NOS/VE was last active.

___ 14. If the dump tape equipment is not ready, the console displays:

```
DUMP TAPE ON CH cc EQ ee UN uu NOT READY (CR WHEN READY).

cc      Channel number.

ee      Equipment number.

uu      Unit number.
```

Ready (prepare) the equipment and press **Enter** to continue.

___ 15. If the write ring is not on the tape, the console displays:

```
DUMP TAPE ON CH cc EQ ee UN uu NO WRITE RING (CR WHEN READY).
```

Insert the write ring, then press **Enter**.

___ 16. When EDD reaches the end of a tape reel before dump completion, the following message is displayed.

```
DUMP TAPE ON CH cc EQ ee UN uu WAITING REEL rr (CR WHEN READY).

cc = dump tape channel number.
ee = dump tape equipment number.
uu = dump tape unit number.
rr = dump tape reel number.
```

___ 17. The following messages are issued when a dump tape to be written upon contains label information prohibiting such action.

```
VSN = vvvvvv FILE NOT EXPIRED.
SELECT DESIRED ACTION -

 1) USE EXISTING TAPE.
 2) UNLOAD EXISTING TAPE.

CR) USE EXISTING TAPE.
```

This message indicates the HDR1 label contains an expiration date greater than today's date, as indicated by either the calendar/clock chip or operator input. Select either option 1 or 2 from this message, based upon the following information.

- Option 1 results in EDD preserving the VOL1 content and fields file accessibility (FA) and implementation identifier (II) of the HDR1 label.
- Option 2 results in EDD unloading the tape. If selected, you are prompted to mount another tape on that unit via the following message.

```
DUMP TAPE ON CH ii EQ jj UN kk
WAITING REEL nn (CR WHEN READY).
```

___ 18. If, while trying to determine if a tape is labelled, tape errors (other than a blank tape error) are encountered when reading the tape, the following message appears.

```
DUMP TAPE ON CH ii EQ jj UN kk READ ERROR.
SELECT DESIRED ACTION -

 1) USE EXISTING TAPE.
 2) UNLOAD EXISTING TAPE.

CR) USE EXISTING TAPE.
```

Select either option 1 or 2 from this message, based upon the following information.

- Option 1 results in EDD attempting to use the tape and constructing its own VOL1 and HDR1 labels (even if the VOL1 was read successfully).
- Option 2 results in EDD unloading the tape. If selected, you are prompted to mount a tape on that unit via the following message.

```
DUMP TAPE ON CH ii EQ jj UN kk
WAITING REEL nn (CR WHEN READY).
```

___ 19. The existing message, EXPRESS DUMP IN PROGRESS, (for a system containing a 721 console) has been augmented by the following message.

```
REEL nn VSN = vvvvvv
```

where nn is the current reel number and vvvvvv is the volume serial number of the tape being written.

___ 20. In the case where the tape controller does not load the character conversion tables correctly, EDD will hang and display the following message.

```
CHii Tj kTS CONVERSION TABLE LOAD ERRORS.
DEADSTART REQUIRED.

ii = dump tape channel number.
 j = 7 for 7-track dump tape.
   = 9 for 9-track dump tape.
 k = M for MTS Tape Subsystem.
   = A for ATS, 67X, FSC, CCC, or 63X Tape Subsystems.
```

Dumping to a tape on a different channel is required.

___ 21. Press **Enter** to initiate the dump.

___ 22. When the dump is complete, the console displays:

```
DUMP id COMPLETE.
```

where id is the express dump number entered in step 6.

The following message is displayed if an extended memory dump was specified and if extended memory was not able to be dumped.

```
DUMP id COMPLETE
DEADSTART REQUIRED
ECS/ESM NOT ACCESSIBLE.
```

The following message is displayed if one or more of the channels selected for the controlware dump options was not able to be dumped.

```
DUMP id COMPLETE.
DEADSTART REQUIRED.

CONTROL WAS NOT DUMPED
FROM THE FOLLOWING CHANNELS

nn    nn    nn    nn    nn    nn
nn    nn    nn    nn    nn    nn
nn    nn    nn    nn    nn    nn
nn    nn    nn    nn    nn    nn
```

where nn is the channel number to be dumped. Anywhere from 1 to 24 channel numbers may be displayed.

The ECS/ESM NOT ACCESSIBLE and CONTROLWARE WAS NOT DUMPED messages may both be displayed if the conditions that cause them to be displayed exist simultaneously. If an error occurred during the dump, one of the following messages appears.

```
ERROR IN (error)
FATAL TO DUMP OPERATION
DUMP UNSUCCESSFUL.
(CR) TO SEE STATUS.
```

Error	Description
UN	Unit errors.
EQ	Controller errors.
CH	Channel errors.

If you press **Enter** following this display, the system displays general and detailed equipment status information.

NOTE

If a CPU is logically turned off, a flag indicating this is set in the dump and the CPU will not be exchanged during execution of EDD. If CPU0 is down on a one-CPU system, both CPU0 and CPU1 must be logically turned off at deadstart to avoid exchanging of the registers. If you reconfigured PPs before the dump, reconfigure them back to their normal settings after system completes the dump.

If an EDD dump does not complete normally (whether interrupted by an operator redeadstarting the machine or by an error), central memory contents may no longer have integrity and attempts to recover using the contents of central memory may fail. Even if a subsequent EDD dump completes normally, central memory may no longer have integrity.

Reloading CM From EDD Tape

Before reloading CM, mount the EDD tape on the tape unit and ready the tape unit. Procedures for reloading CM from EDD tape are:

___ 1. The console displays the following options.

```
ENTER RELOAD OPTION

E - RELOAD ESM ONLY
C - RELOAD CM ONLY
B - RELOAD CM AND ESM
```

E Select this option to reload ESM or STORNET only. (NOS or NOS/BE) A non-zero level deadstart is required. The system prompts you to:

```
        ENTER ESM CHANNEL

(CR) - CONTINUE OS LOAD
(BS) - PREVIOUS DISPLAY


CHANNEL - cc
```

The value cc is the channel specified in the default parameter block in the CTI/MSL disk area. After the channel has been entered, the system prompts you for the EDD tape parameters.

C Select this option to reload CM only. For NOS or NOS/BE, a level 3 deadstart is required. The system prompts you for the EDD tape parameters.

B Select this option to reload CM and ESM from the EDD tape. For NOS or NOS/BE, a level 3 deadstart is required. You are prompted for the ESM channel and EDD tape parameters.

___ 2. The console next displays the following EDD tape parameters.

```
CM/ESM RELOAD DEVICE TYPE-m

1=667, 669        (800 BPI)
2=667             (800 BPI)
  639, 679, 698 (1600 BPI)
3=639, 679, 698 (6250 BPI)
```

The value m is the device type specified in the default parameter block of the CTI/MSL disk area. If the default parameter block is not present, zeros are displayed.

___ 3. Press **Enter** to use the device type which is currently displayed or type 1, 2, or 3, then press **Enter** to specify an alternate device. The console displays:

```
CM/ESM RELOAD DEVICE TYPE-m

CHANNEL-cc

(BS) - BACK TO PREVIOUS ENTRY.
```

The value cc is the channel specified in the default parameter block in the CTI/MSL disk area. If the parameter block is not present, zeros are displayed.

It is a configuration requirement that neither channels 0 nor 1 be used for a reload. Although usage of these channels is not verified, the attempted reload may fail if either of these channels is used.

___ 4. Press **Enter** to use the channel which is currently displayed, or key in the two-digit channel number of the tape unit from which memory is to be reloaded and press **Enter**. The console displays:

```
CM RELOAD DEVICE TYPE-m
CHANNEL-cc
EQUIPMENT-e

(BS) - BACK TO PREVIOUS ENTRY.
```

The value e is the equipment number specified in the default parameter block in the CTI/MSL disk area. If the default parameter block is not present, zeros are displayed.

___ 5. Press **Enter** to use the equipment number displayed, or key in the equipment number and press **Enter**. The console displays:

```
CM RELOAD DEVICE TYPE-m
CHANNEL-cc
EQUIPMENT-e
UNIT-uu

(BS) - BACK TO PREVIOUS ENTRY.
```

The value uu is the unit number specified in the default parameter block of the CTI/MSL disk area. If the default paramater block is not present, zeros are displayed.

___ 6. Press **Enter** to use the unit number displayed, or key in the two-digit unit number and press **Enter**.

CTI returns to the OPERATOR INTERVENTION display (figure 4-9), appending the appropriate message (one of the following) to the bottom of the display.

```
CM WILL BE RELOADED FROM EDD TAPE

ESM WILL BE RELOADED FROM EDD TAPE

CM AND ESM WILL BE RELOADED FROM EDD TAPE
```

Performing a Printer Dump (Available During Deadstart From CIP Tape Only)

A printer dump is an option offered on the UTILITIES display. It dumps the contents (in octal or hexadecimal) of part or all of a PP memory, central memory, register files, IOU registers, CM registers, CP registers, and control store buffers selected by the operator to a line printer.

CTI supports print capability on a 512-line printer and the 580-12, 580-16, 580-20, 580-120, 580-160, or 580-200 line printers using print array cartridges 596-1 through 596-6. Not all computer systems or operating systems, however, support these printers.

The following procedure assumes that your line printer is ready and that you have deadstarted the system and selected the UTILITIES display.

___ 1. Type P. The console displays printer dump options. The options offered depend on the computer system model (refer to section 2 of this manual). As you cannot return to the UTILITIES display from this display, you must redeadstart the system.

___ 2. Select option A or B.

A Select this option to initialize the 512-line printer buffer image with the data necessary to print with a 512-1 print train. The A parameter provides compatibility with previous systems.

B Select this option to initialize the 580-line printer buffer image and format buffer image memories.

The console displays:

```
PRINTER CH = 12
```

___ 3. Press **Enter** to accept the default channel number, or key in desired printer channel number and press **Enter** to select a different channel. The following line appears below the channel display.

```
PRINTER EQ = 5
```

___ 4. Press **Enter** to accept the equipment number for the line printer, or key in the equipment number for line printer, if different from the default value, and press **Enter**.

If option A was selected initially, proceed to step 7.

If option B was selected initially, the following message appears.

```
1 = 596-1
2 = 596-2
3 = 596-3
4 = 596-4
5 = 596-5
6 = 596-6
TRAIN SELECT = 5
```

___ 5. Press **Enter** to select the default train selection shown on the last line, or key in the desired printer train number, if different from the default value, and press **Enter**.

The following message appears (option B only).

```
SET FORMAT BUFFER Y OR N
        Y = YES
        N = NO

     (DEFAULT = Y)
```

___ 6. Press **Enter** to accept the default selection, or key in the desired option, if different from default value, and press **Enter**. If you select the Y option, the 580 print buffer and format buffer memories are initialized. If you select the N option, only the print buffer memory is initialized.

___ 7. Enter the letter of a dump option and press **Enter**. Depending on your selection, you may be prompted to enter additional parameters. If so, respond as follows.

NOTE

Do not select option A or B after selecting any other options. If you do, the screen goes blank and you must deadstart.

Prompt	Entry
PP NO=	Number of PP to be dumped. Type A and press **Enter** to dump all PPs except logical PP0.
PPU NO	Number of PPU to be dumped (CYBER 170 model 176 only). Type the letter A and press **Enter** if all PPUs are to be dumped.
START ADRS	Starting central memory address (1 through 10 octal digits, or 1 through 7 hexadecimal digits).
END ADRS	Last memory address to be dumped (from 1 to 10 octal digits for octal dump; from 1 to 7 hexadecimal digits for hexadecimal dump).
SELECT ADDRESS MODE	Type H for hexadecimal address entry or B for byte address (octal) entry mode.
CPU=[3]	Enter CPU number (options G, J, M, and N).

Press **Enter**. The system executes the option selected and displays dump options.

___ 8. Enter the letter of another option and press **Enter**, or terminate the dump by redeadstarting the system.

___ 9. During the printer dump sequence, you may encounter an error informative message. Refer to appendix B for a directory of messages and responses.

3. This prompt is displayed only on systems with multiple CPUs when both are available.

Selecting an Alternate Deadstart Device

Option S of the UTILITIES display allows you to specify an alternate tape unit or disk device for the deadstart operation. Entries made during this option override words 2, 4, 5, 6, 7, and 10 of the deadstart program. Refer to section 3 for a detailed description of the deadstart program parameters.

This procedure assumes you have deadstarted the system and have selected the UTILITIES display.

___ 1. Type S. The following display appears on left screen:

```
DEADSTART DEVICE TYPE - m
(1=66X, 2=63X/67X, 3=DISK)
```

where m is the device type indicated on deadstart program (word 6).

___ 2. Press **Enter** to use device m, or specify an alternate device type by keying in its type number (1, 2, or 3) and press **Enter**. The following line appears.

```
CHANNEL - cc
```

where cc is the channel indicated on the deadstart program (words 2, 4, 5, 7, and 10).

___ 3. Press **Enter** to use channel cc, or specify an alternate channel by keying in the channel number and press **Enter**. The following line appears.

```
EQUIPMENT - e
```

where e is the equipment indicated on the deadstart program (word 6).

___ 4. Press **Enter** to use equipment e, or specify an alternate equipment by keying in the equipment number and press **Enter**. The following line appears.

```
UNIT - uu
```

where uu is unit number indicated on the deadstart program (word 6).

___ 5. Press **Enter** to use unit uu, or key in the unit number and press **Enter** to specify an alternate unit.

The system will deadstart from the alternate device; the INITIAL OPTIONS display reappears.

Modifying Default Parameters

Option D permits you to define and change the default parameters used with the CTI routines. Following is the initial display for the A option.

```
DEFAULT PARAMETER PROCESSING.

EACH ENTRY WILL BE PROCESSED
WHEN A -CR- IS ENTERED.

SPECIAL KEY INPUTS
(+)  - DISPLAY THE NEXT DEFAULT BLOCK.
(-)  - DISPLAY THE PREVIOUS DEFAULT BLOCK.
BKSP - DELETE THE LAST CHARACTER.
CR   - ENDS EACH ENTRY WRITES DEFAULTS TO DISK.

ALL ENTRIES ARE IN THE FORMAT:

 XXXX

WHERE XXXX = 1 TO 10 ALPHA-
NUMERIC ENTRY DEFINING THE
PARAMETER TO BE PROCESSED.

(ENTER + TO CONTINUE.)
```

Enter a (+) character and press **Enter**. The first default block display appears.

```
DEADSTART TAPE DEFAULTS

ENTER TAPE TYPE.........01
(1 = 66X, 2 = 63X/67X)
```

Enter the proper tape type, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER CHANNEL NUMBER....13
```

Enter the proper channel number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER EQUIPMENT NUMBER..00
```

Enter the proper equipment number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER UNIT NUMBER.......00
```

Enter the proper unit number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER + TO CONTINUE
```

A (+) character causes the following default block display to appear.

```
EDD TAPE DUMP DEFAULTS

ENTER TAPE TYPE ..............  01
1=667, 669              ( 800 BPI)
2=667                   ( 800 BPI)
  639, 679, 698, 5698   (1600 BPI)
3=639, 679, 698, 5698   (6250 BPI)
4=5680                 (38000 BPI)
```

Enter the proper tape type, if different from the displayed value, and press **Enter**. The following line appears.

```
ENTER CHANNEL NUMBER....13
```

Enter the proper channel number, if different from the displayed value, and press **Enter**. The following line appears.

```
ENTER EQUIPMENT NUMBER..00
```

Enter the proper equipment number, if different from the displayed value, and press **Enter**. The following line appears.

```
ENTER UNIT NUMBER.......00
```

Enter the proper unit number, if different from the displayed value, and press **Enter**. The following line appears.

```
ENTER + OR - TO CONTINUE
```

A (+) character causes the next default block display to appear.

```
SYSTEM DISK DEFAULTS

ENTER CHANNEL NUMBER....01
```

Enter the proper channel number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER UNIT NUMBER..00
```

Enter the proper unit number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER + OR - TO CONTINUE
```

A (+) character causes the next default block display to appear.

```
ALTERNATE SYSTEM
DISK DEFAULTS

ENTER CHANNEL NUMBER....01
```

Enter the proper channel number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER UNIT NUMBER.......00
```

Enter the proper unit number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER + OR - TO CONTINUE
```

A (+) character causes the next default block display to appear.

```
MSL-HVS DISK DEFAULTS

ENTER CHANNEL NUMBER....01
```

Enter the proper channel number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER UNIT NUMBER.......00
```

Enter the proper unit number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER + OR - TO CONTINUE
```

A (+) character causes the next default block display to appear.

```
LINE PRINTER DUMP DEFAULTS

ENTER CHANNEL NUMBER....12
```

Enter the proper channel number, if different from the displayed value, and press **Enter**. The display adds the following line.

```
ENTER EQUIPMENT NUMBER..07
```

Enter the proper equipment number, if different from the displayed value, and press **Enter**. The display adds the following lines.

```
ENTER TRAIN TYPE........04
(1 = 596-1, 2 = 596-2)
(3 = 596-3, 4 = 596-4)
(5 = 596-5, 6 = 596-6)
```

Enter the proper train type, if different from the displayed value, and press **Enter**. The display adds the following lines.

```
FORMAT CONTROL MODE........01
(1 = PROGRAMMABLE, 2 = FORMAT TAPE)
```

Enter proper format control mode, if different from displayed value, and press **Enter**.

Upon completion of the default parameter entry, the following message is displayed.

```
PARAMETER PROCESSING COMPLETE
ENTER (-), OR DEADSTART
```

Performing a Power-On Initialization

Use the following procedure to initialize your computer system after applying power to the mainframe or after performing a maintenance action. By following this procedure, you will first initialize the two port mux (TPM) and initialize the CPU.

___ 1. Complete following steps from your CC598B to initialize the TPM.

If your system has dual IOUs:

___ a. Press **Ctrl-F2** to bring up the CONSOLE MAIN MENU.

___ b. From the CONSOLE MAIN MENU, type M to get the MAINTENANCE OPTIONS menu.

___ c. From the MAINTENANCE OPTIONS menu, type O to bring up the MAINTENANCE OPTIONS - IOU0 display

___ d. From the MAINTENANCE OPTIONS - IOU0 display, type I to initialize the IOU0 two port mux.

___ e. Repeat steps a through d for IOU1.

NOTE

If IOU1 is initialized first, you can proceed to steps 2 and 3.

If you have a single IOU system:

___ a. Press **Ctrl-F2** to bring up the CONSOLE MAIN MENU.

___ b. From the CONSOLE MAIN MENU, type M to bring up the MAINTENANCE OPTIONS - IOU0 display.

___ c. From the MAINTENANCE OPTIONS - IOU0 display, type I to initialize the TPM.

If you have a dual IOU system:

___ a. Type M to bring up the MAINTENANCE OPTIONS menu.

___ b. Type O to bring up the MAINTENANCE OPTIONS - IOU0 display.

___ c. From the MAINTENANCE OPTIONS - IOU0 display, type I to initialize the two port mux.

___ 2. From the UTILITIES display (refer to section 2), type I to initialize the CPU. The INITIAL OPTIONS display appears with the following message at the bottom of the display.

```
ALL MAINFRAME MEMORIES WILL
BE INITIALIZED FOR MSL/OS LOADS
```

___ 3. Enter one of the following.

(CR) To initialize the system (deadstart recovery level 0) and load the operating system. If the deadstart recovery level is 3, the following message appears.

```
LEVEL 3 RECOVERY NOT POSSIBLE

CENTRAL MEMORY INITIALIZATION
HAS BEEN SELECTED BY THE OPERATOR,
OR AUTOMATICALLY SET BY THE
HARDWARE.

DEADSTART AND SELECT A DIFFERENT
RECOVERY LEVEL, OR DO NOT SELECT
MAINFRAME INITIALIZATION.
```

Reset the deadstart program for a level 0 deadstart and initiate a deadstart.

NOTE

Bit 33 of the NIO EC register is defined as the "System Initialized" bit. This bit, when set, indicates that the mainframe was intialized during a previous deadstart, and that no unrecoverable errors were encounterd. Bit 33 is automatically cleared when power is applied to the system.

If the operator selects any OS load option, CTI checks the state of the system initialized bit. If the bit is set, no further action is taken. If the bit is clear, CTI sets an internal flag which indicates that mainframe initialization is to be performed and checks the deadstart recovery level. If the recovery level is 3, the preceding message is displayed, and the deadstart is aborted.

M To initialize the system (including the alternate PP) and load off-line maintenance software.

The alternate PP is always initialized on maintenance loads unless CTI is incapable of accessing the CPU. If CTI cannot access the CPU, the system displays:

```
UNABLE TO ACCESS CPU VIA
THE MAINTENANCE CHANNEL
ENTER (CR) TO CONTINUE OR
DEADSTART AND INFORM CE
```

NOTE

CTI clears the system initialized bit in the NIO EC register when the operator selects the M option. If you select an OS load on the next subsequent deadstart, CTI forces the execution of a mainframe initialization as described in the preceding NOTE. Under such conditions, a level 3 deadstart is not possible.

___ 4. If communication is lost with a PP during initialization, the following message is displayed.

```
PP xx NOT RESPONDING
  DEADSTART ABORTED
```

Reinitiate the deadstart, logically turn off the PP, and repeat the procedure.

Loading and Installing Disk Subsystem Microcode from Tape

This procedure loads peripheral microcode to 7155 disk controllers and 7165 CYBER Channel Couplers, and installs peripheral microcode onto specified 844, 885, or 895 disk drives. The procedure makes the following assumptions.

- The system has been deadstarted from a CIP tape.
- The tape containing peripheral microcode has been mounted on a tape unit. (The CIP tape and the tape containing peripheral microcode may be separate tapes, however, all peripheral microcodes to be installed must be on the same tape.)
- The UTILITIES display (option U of the INITIAL OPTIONS display) has been selected.
- Any 844, 885 or 895 disk on which peripheral microcode will be installed is mounted and/or ready to perform the necessary write functions. (For 895 drives, this requires that the area to receive peripheral microcode has been formatted to small sectors.)
- All channel, equipment and unit numbers entered are octal values.
- If installing to an 844-4X, it is connected to a 7155 type controller.

___ 1. Type M. The following display appears on the screen.

```
   DISK SUBSYSTEM PERIPHERAL
MICROCODE INSTALLATION UTILITY

ENTER DISK TYPE

A = 844-4X
B = 885
C = 895
D = 834 (ISD-1)
E = 836 (ISD-2)
```

___ 2. Select the appropriate option for the disk on which peripheral microcode is to be installed. The screen is cleared and the following message appears.

```
DISK DRIVE LOCATION

 CHANNEL - 00
```

___ 3. Press **Enter** to accept channel 00, or key in an alternate channel and press **Enter**. The display adds the following lines.

```
EQUIPMENT - 0


(BS) - BACKSPACE TO PREVIOUS ENTRY
```

___ 4. Equipment number must be zero for all disk drives. Press the **Backspace** to change disk channel number, or press **Enter**. The display adds the following line when the **Enter** is pressed.

```
UNIT - 00
```

___ 5. For 844 drives, unit number must be in the range 00 - 07. Press **Enter** to accept unit 00, or key in an alternate unit number, and press **Enter**.

For 885 drives, unit number must be in the range 40 - 57. Enter a valid unit number and press **Enter**.

For 895 disk drives, 00 is interpreted as su, where s = storage director number, and u = unit number. Press **Enter** to accept storage director 0, unit 0, or key in alternate values, and press **Enter**.

After **Enter** has been pressed, the screen is cleared and the following line appears.

```
ENTER TAPE TYPE - t

(1=66X, 2=63X/67X/698)
```

NOTE

The tape parameters displayed are initially defaulted to the CIP deadstart tape device. When entering these parameters, enter the values for the tape which contains peripheral microcode. If peripheral microcode is on the CIP tape, press the Enter key for each parameter.

___ 6. Press **Enter** to accept t as shown, or enter an alternate tape type. The display adds the following line.

```
CHANNEL - cc
```

___ 7. Press **Enter** to accept cc as shown, or key in an alternate channel, and press **Enter**. The display adds the following lines.

```
EQUIPMENT - e


(BS) - BACKSPACE TO PREVIOUS ENTRY
```

___ 8. Press the **Backspace** key to change the tape channel number. Press **Enter** to accept e as shown, or key in an alternate equipment number, and press **Enter**. The display adds the following line.

```
UNIT - uu
```

___ 9. Press the **Backspace** to change the tape equipment number. Press **Enter** to accept uu as shown, or key in an alternate unit number, and press **Enter**.

The system now begins the peripheral microcode load/install process. Self-explanatory messages are presented during the process to inform the operator of the progress of the installation process.

___ 10. When the process is complete, one of the following displays is presented on the screen, depending upon the disk type selected.

```
834             836             844/885         895

INSTALLED       INSTALLED       INSTALLED       INSTALLED
MA462-XX        MA462-XX        MA721-XX        MA464-XX
MH422-XX        MH424-XX
MD422-XX        MD424-XX

ENTER (CR) TO CONTINUE.
```

Where XX is the revision number of the peripheral microcode(s) installed.

___ 11. To load/install peripheral microcode to another device, press **Enter**. The ENTER DISK TYPE display appears on the screen. Repeat steps 2 through 5, and step 11 for each drive.

Operator Intervention Procedures

The following procedures utilize options presented on the OPERATOR INTERVENTION display. The OPERATOR INTERVENTION display may be accessed only during a deadstart from disk operation.

Running Hardware Verification Sequence (CYBER 994 Only)

Use this procedure to initiate the hardware verification sequence (HIVS). This procedure assumes you have deadstarted the system and have selected the OPERATOR INTERVENTION display.

The hardware verification sequencer controls the execution of a set of go/no go tests of the peripheral processor subsystem (PPS), central memory (CM), and the central processor unit (CPU). The tests are taken from the MSL and run under control of the sequencer using the capabilities of the common maintenance software executive (CMSE). The tests executed depend on the model of machine being tested. Refer also to section 2 of this manual for additional information on the HARDWARE VERIFICATION option of the OPERATOR INTERVENTION display. Appendix E includes a brief description of each HIVS test.

NOTE

In order to execute a level 3 recovery deadstart after verifying the hardware, you must first set the deadstart program for a level 3 recovery before deadstarting.

___ 1. Select V from the OPERATOR INTERVENTION display; the HARDWARE VERIFICATION SEQUENCE display appears. HIVS displays the following messages during testing sequence.

```
TESTING REG
TESTING PPS
TESTING CM
TESTING CPU xx
```

When hardware is tested that is either turned OFF via CTI or is physically not present, the following messages appear.

```
NO PP AVAILABLE
NO CM AVAILABLE
NO CP AVAILABLE
NO EM AVAILABLE
```

If the test sequence completes without detecting errors, HIVS displays:

```
TESTING COMPLETE-DEADSTART
```

___ 2. If an error is detected, HIVS displays one of the following error messages.

```
ERROR PP xx
ERROR CM
ERROR CPU xx
ERROR REG
```

where xx indicates the PP or CPU in error.

Refer to appendix B for a directory of error messages and responses.

Resetting the Deadstart Parameters

The P option of the OPERATOR INTERVENTION display provides a display of the contents of the words 12, 13, and 14 of the deadstart program. Parameters entered using this display override the following deadstart program parameters.

- Deadstart level
- CMRDECK number (NOS) and CMR number (NOS/BE)
- Deadstart program words 12 and 14

For a detailed description of deadstart program parameters, refer to section 3.

Use this procedure to reset the deadstart program parameters. The procedure assumes you have deadstarted the system and have selected the OPERATOR INTERVENTION display.

___ 1. Select P from the OPERATOR INTERVENTION display; the DEADSTART PARAMETERS display appears.

___ 2. Reset the level of deadstart by typing:

```
I=x
```

Value x is the deadstart level as follows:

Level	Use
0	Initial deadstart; it is used when recovery deadstart is impossible.
1	To resume normal processing following maintenance.
2	For system test only.
3	Following equipment malfunction.

___ 3. Specify the CMRDECK (NOS), or CMR (NOS/BE) number by typing:

```
C=xx
```

The value xx can range from 0 to 77_8.

___ 4. Specify whether or not the NOS system load is to halt and display CMRDECK by typing:

```
D=Y
```

Display CMRDECK.

```
D=N
```

Do not display CMRDECK.

Refer to section 3 for instructions on modifying the CMRDECK.

NOTE

Steps 5 and 6 are for maintenance operations only and do not affect operating system deadstart.

___ 5. Reset value of deadstart program word 12 by typing:

```
W12=000a
```

(refer to Setting Word 12 in section 3).

___ 6. Reset value of deadstart program word 14 by typing:

```
W14=ffff
```

This field is currently reserved for future use by maintenance software or operating system.

___ 7. Press **Enter** to accept the deadstart program parameters shown and continue the deadstart sequence. Press the **Backspace** key to accept parameters and return to OPERATOR INTERVENTION display.

Build Deadstart Disk Operations

The following procedures use one or more of the options offered on the BUILD DEADSTART DISK display and MANUAL OPERATIONS display. The BUILD DEADSTART DISK display may be accessed only during a deadstart from CIP tape operation.

NOTE

This procedure should be used only after an initial install has been performed.

Manually Replace Modules on the Deadstart Disk

Use the manual replacement procedure when you have modified the components of the CIP tape or when you need tests other than the predefined subset of tests.

Should the entire CIP require more disk space than is normally allocated in a shared-disk mode, you must edit the released binary tape or circumvent this limitation. Editing the CIP tape is the preferred method.

After you have edited the CIP binary tape, if necessary, perform the following steps to replace CIP components in a shared-disk mode.

___ 1. Ensure that the tape and disk controlware are present and functioning properly, and perform a system warmstart.

___ a. Mount the CIP tape without the write-enable ring and ready the unit.

___ b. Set the deadstart program for a warmstart from tape. Refer to Warmstart Procedures Summary in section 3. After a successful warmstart, the INITIAL OPTIONS display appears.

___ 2. Replace CTI module on the CIP device.

___ a. Press **Enter** or type B while displaying the INITIAL OPTIONS display. The BUILD DEADSTART DISK display appears.

___ b. Type M. The MANUAL OPERATIONS display appears.

___ c. Type C to install CTI. The following display appears.

```
ENTER ONE OF THE FOLLOWING
(CR) - INSTALL DEADSTART
       MODULE ON DISK
  R  - RELEASE OF CTI-MSL/HIVS/OS
       RESERVED DISK SPACE
```

___ d. Press **Enter**. The system now requests channel, equipment, and unit numbers for the disk device. Enter channel, equipment, and unit number for device.

___ e. Press **Enter**. The following warning message appears.

```
*WARNING*

PERMANENT FILES WILL BE LOST IF CTI IS NOT
ALREADY INSTALLED ON THIS DEVICE

(CR) TO CONTINUE
```

___ f. Press **Enter**. The system requests channel, equipment, and unit numbers of disk device.

The following message appears when CTI is loaded successfully.

```
INSTALL COMPLETE
(CR) TO PROCESS DIFFERENT DEVICE
```

___ g. If your site has more than one system disk, press **Enter** and repeat steps 2d through 2h for each disk (optional).

___ h. Initiate a deadstart to return to the INITIAL OPTIONS display. The version of CIP is indicated at the bottom of the display.

___ 3. Replace CTI/MSL CDA modules.

___ a. Press **Enter** or type B while displaying the INITIAL OPTIONS display; the BUILD DEADSTART DISK display appears.

___ b. Type M; the MANUAL OPERATIONS display appears.

___ c. Select the D option, then enter the disk and tape channel and unit numbers as prompted by the display. If the disk unit selected for the CDA utility is reserved by another controller, the following message appears.

```
DISK UNIT RESERVED
```

Clear the reserved status of the disk unit to initiate an automatic retry.

If the disk selected for the CDA utility is a fixed module drive whose READ ONLY switch is set, the following message appears.

```
READ ONLY SELECTED.
```

Turn off the READ ONLY switch and press **Enter** to initiate automatic retry.

___ 4. Replace microcode on the CIP device.

___ a. Type B while displaying the REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The REPLACE CTI/MSL DISK AREA MODULE display appears when modules have been replaced.

___ 5. Replace default parameter deck on the CIP device from CIP tape.

___ a. Type A while displaying the REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The REPLACE CTI/MSL DISK AREA MODULE display appears when modules have been replaced.

___ 6. Replace EI on CTI/MSL disk area.

___ a. Type C while displaying the REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.

___ 7. Replace CC634B SCD on the disk.

___ a. Type D while displaying the REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.

___ 8. Replace MDD on the disk.

___ a. Type E while displaying the REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.

___ 9. Replace DFT module on the disk.

___ a. Type F while displaying the REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.

___ 10. Replace SCI

___ a. Type H while displaying REPLACE CTI/MSL DISK AREA MODULE display.

___ b. The CAU initial options display appears when installation is complete.

___ 11. Replace MSL module to disk.

___ a. Press **Enter** or type B while displaying the INITIAL OPTIONS display; the BUILD DEADSTART DISK display appears.

___ b. Type M; the MANUAL OPERATIONS display appears.

___ c. Type T; the console displays:

```
          TDX
DISK AND TAPE TRANSFER UTILITY
   CR TO CONTINUE
```

___ d. Press **Enter** then enter TDX parameters as prompted. The TDX option display appears upon completion of these entries.

___ e. Type A to build MSL from tape.

___ f. Type F to select MSL/OS shared disk mode. Programs are installed at the predefined area of the disk.

The following message appears.

```
SAVE COMMAND BUFFER AREA
Y = YES  N = NO
```

___ g. Type N in response to the above message (you do not have to press **Enter**). TDX initializes the PNT and SRT and presents the following display.

```
COPY FROM
-CR- = 1ST NAME
```

___ h. Press **Enter** to prompt TDX to begin copying with the first program it encounters. When the COPY FROM selection is complete, TDX presents the following display.

```
COPY THRU
-CR- = LAST NAME
```

___ i. Press **Enter** to instruct TDX to copy to the last program on the tape. For tape-to-disk copies, TDX has the ability to verify data written to disk. TDX presents the following display.

```
DATA VERIFY (Y/N)
```

___ j. Type Y. TDX transfers each program to the disk, displaying the name of each program as it is copied to the disk. TDX skips over any command buffers located on the tape. Upon completion of the copy operation, TDX displays the first cylinder, track, and sector used for the copy. Press the **space bar** to display the last available cylinder for the complete MSL build.

NOTE

If the SRT FULL message appears, the edited MSL is too large for the predefined disk area. You must either obtain permission to use more disk space and install in maintenance only mode, or use an alternate tape editing method and install a partial MSL. In either case, you cannot continue from this point without deadstarting.

___ k. Press the **Space Bar** to clear the display and display a reduced set of TDX options.

___ 12. Install command buffers to disk.

___ a. Type B when the TDX options display is present. TDX presents the following display.

```
COPY FROM
-CR- = 1ST NAME
```

___ b. Press **Enter** to cause TDX to begin copying with the first command buffer it encounters; TDX presents the following display.

```
COPY THRU
-CR- = LAST NAME
```

___ c. Press **Enter** to instruct TDX to copy to the last command buffer on the tape. For tape-to-disk copies, TDX has the ability to verify data written to disk; TDX presents the following display.

```
DATA VERIFY (Y/N)
```

___ d. Type Y. TDX transfers each command buffer to the disk, displaying the name of each command buffer as it is copied to the disk. Upon completion of the copy operation, TDX displays the last cylinder, track, and sector used for the copy.

___ e. Press the **Space Bar** to clear the message and display a reduced set of TDX options.

___ 13. The system is now ready to install the operating system.

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Monitor Display Driver (MDD) 5

MDD is a PP program that utilizes the Two Port Multiplexer (TPM) to provide a window to the hardware status. This program is built to run on the NOS, NOS/BE, or NOS/VE operating system. Once initiated, MDD detaches itself from the operating system until directed to terminate via the MDD console. MDD is not dependent on an operating system and should function if the operating system malfunctions due to hardware or software problems. As of the CIP level 9 release, MDD is contained in SCI (combined VPB, SCD and MDD). If SCI is already executing in a PP when MDD is initiated, MDD mode is turned on for that copy of SCI. A new copy is not loaded. This means that one copy of SCI services both MDD and the CC598B console. If NOS/VE is executing in a dual state environment when MDD is initiated, MDD must be initiated from the NOS/VE console.

MDD Terminal Control

MDD is designed to allow sharing of the communications port (and any terminal connected to it). If the user presses the **F7** key on a CDC 721 terminal or a CC598B console, MDD releases the port (and thereby the terminal) if another driver wishes to use the port. If no other driver has signaled a request for the port, MDD responds with a beep. If a display device other than a CDC 721 terminal or a CC598B console is used, the operator should type an RS (Record Seperator = 1E hexadecimal) and a lower case w.

Command Syntax

MDD receives commands from the MDD console to:

- Display or change central memory (60 or 64 bit)
- Display, interpret, or change the contents of registers
- Display or change control store (64 or 128 bit)
- Display the DFT block or buffers
- Set flags to control DFT processing
- Stop or start PPs
- Stop or start a CPU

Using any of the display commands should have no effect on an operating system. Most MDD commands allow position dependent parameters, keywords, or a combination of both. This means that for the command whose syntax is:

```
DR element RN=register_number RC=repeat_count
```

where element can be one of the keywords i, m, or p, all of the following do the same thing.

```
DR i RN=30 RC=9
DR i 30 9
DR i RN=30 9
```

The delimiter between parameters in MDD commands can be either a space or a comma. Parameters can be positioned with multiple commas. All of the examples below are correct.

```
DB MA=0,WC=10
DB,,WC=10
DB 0 10
DB,,10
```

MDD Initialization

MDD can be initiated on either Port 1 or Port 0 of the TPM. MDD waits indefinitely for the Carrier ON status. MDD cannot be directed to terminate if initiated by CIP (except in 180 stand alone mode).

To bring up MDD via CTI, select option M and type:

```
MDD=YES
PORT=port number desired
```

CAUTION

This mode should only be used to track problems associated with an operating system deadstart.

NOTE

When deadstarting a mainframe via the TPM, it is possible for SCD and MDD to share the same port. If this occurs, the operator needs to use **F7** to toggle use of the terminal between these two functions.

The timeout parameter has been removed from the NOS X.MDD command. To bring up MDD under NOS, type the following under Dynamic System Display (DSD).

```
X.MDD(p)
```

where p is an octal digit. If p=1, MDD uses Port 0 of the TPM. If p is any other value or not specified, MDD uses Port 1.

In a dual state environment, MDD must be initiated from the NOS/VE side through use of the CHANGE_MDD_OPERATING_MODE command. However, MDD could be initiated from the 170 side before NOS/VE deadstart is initiated.

To bring up MDD under NOS/BE, type the following under DSD.

```
UNLOCK,passwrd.
MDD,n.
LOCK.
```

The n parameter follows the protocol for the p parameter in NOS. n specifies the port number, zero or one.

CHANGE_MDD_OPERATING_MODE Command

Enter this command only under the direction of a site analyst. After NOS/VE has been initiated, this command should be used to bring up MDD in either a dual state or a standalone NOS/VE environment.

Purpose To turn MDD on or off or to change the port on which its output is displayed.

Format **CHANGE_MDD_OPERATING_MODE** *a p*
a=ON_OR_OFF
p=PORT_NUMBER

Parameters *a*

Specifies whether MDD is to be turned on or off.

b

Specifies the port number MDD uses when displaying output.

Remarks

- This command must be entered from the Critical Display Window.
- There is no abbreviated form of this command.
- SCI/MDD can only be active on one port.

Conventions

Delimiters	Only a comma or space may be used.
Parameter Options	These are listed in the explanatory text following the parameter, if applicable.
Required Parameters	These are listed in the explanatory text following the parameter, if applicable.
Parameter Defaults	These are listed in the explanatory text following the parameter, if applicable.

Central Memory Display Commands

All of the central memory display commands save the address and word_count parameters. The default values for the address and word_count on the next central memory display are obtained from these values.

Display Bytes

Purpose The DB command displays 64-bit memory in 8-bit byte format (one word per line, eight groups of two hexadecimal digits per word).

Format DB

MA=byte_address
WC=word_count

Parameters *MA*

Starting byte address for the central memory display (hexadecimal). This value is rounded down to the nearest word boundary. The default value is zero or the address used by the most recent memory, control store, or DFT command.

WC

Number of words to display (hexadecimal). The default is 8 or the most recently entered value.

Display CM

Purpose The DC command displays the least significant 60 bits of central memory in octal word format (one word per line, twenty octal digits per word).

Format DC

MA=octal_address
WC=word_count

Parameters MA

Starting word address for the central memory display (octal). The default value is zero or the address used by the most recent memory, control store, or DFT command.

WC

Number of words to display (octal). The default is 8 or the most recently entered value.

Display Hexadecimal CM

Purpose The DH command displays 64-bit memory in hexadecimal word format (one word per line, 16 hexadecimal digits per word).

Format

DH
MA=word_address
WC=word_count

Parameters *MA*

Starting word address for the central memory display (hexadecimal). The default value is zero or the address used by the most recent memory, control store, or DFT command.

WC

Number of words to display (hexadecimal). The default is 8 or the most recently entered value.

Display Virtual Memory

Purpose The DM command can be used to display memory in a virtual environment. When first initiated, MDD initializes all of its default virtual memory parameters from the hardware registers. These values may be changed if desired. The memory is displayed by first displaying the segment number and the memory in byte format (eight groups of two hexadecimal digits) with an eight-digit relative byte offset for an address. The Real Memory Address (RMA) for the first word displayed is saved to be used as the default for the DC, DH, and DB commands. This allows the user to determine the RMA for an arbitrary PVA by simply entering a DB, DH, or DC command. The PVA entered is retained as the default PVA for the next execution of the DM command.

NOTE

MP, JP, PT, PS, and PL are reinitialized when the SE command is entered. The SE command is necessary if MDD is activated prior to NOS/VE deadstart.

Format

DM
PVA=virtual_address
WC=word_count
xp=exchange_package
PT=page_table_rma
BO=byte_offset
PS=page_size_mask
PL=page_table_length

Parameters *PVA*

Process Virtual Address to use as the starting memory address for the display. This is an eleven-digit hexadecimal number consisting of three digits of segment number and eight digits of byte offset. The default is all zeros or the most recently entered value.

WC

The number of words to display (hexadecimal). This defaults to the previously used value.

xp/MPS

xp/JPS

xp/XPS

Exchange Package address to be used to obtain the segment table address used in converting a PVA to a System Virtual Address (SVA) prior to searching the Page Table. Just specifying the keyword uses the value last specified for the keyword. Specifying xp=hex_address changes the value that is associated with the keyword xp. If this parameter is omitted, the keyword last entered on a DM command is assumed. The initial defaults for MP and JP are the values of the monitor_state and job_process registers when MDD is started up.

PTA

Page Table Address. The initial default is the page table address when MDD is started up. The default is changed by entering this parameter.

BO

Byte Offset. This parameter can be used if you wish to display a different offset in the same segment. If this parameter is used, the PVA parameter should not be used.

PS

Page Size mask. Hexadecimal number for the new page size mask. The initial default is the page size mask when MDD is started up. The default is changed by entering this parameter.

PL

Page table Length. Hexadecimal number for the new page table length. The initial default is the page table length when MDD is started up. The default is changed by entering this parameter.

Display Next Central Memory Block

Purpose The + repeats the last CM display command using a new starting address. If no increment is given, the CM displayed starts where the previous display ended. If the increment is specified, the starting address for the memory displayed is equal to the current_starting_address plus the increment.

Format

```
+
    increment
```

Parameters *increment*

Optional starting_address increment when the CM display command is repeated. The increment is interpreted in the same manner as the word or byte count of the previous memory display command.

Display Previous Central Memory Block

Purpose The – repeats the last CM display command using a new starting address. If no decrement is given, the CM displayed ends where the previous display started. If the decrement is specified, the starting address for the memory displayed is equal to the current_starting_address minus the decrement.

Format

```
–
    decrement
```

Parameters *decrement*

Optional starting_address decrement when the CM display command is repeated. The decrement is interpreted in the same manner as the word or byte count of the previous memory display command.

Central Memory Change Commands

The following commands are used to change central memory. Each attempt to write central memory checks the address against the OS Bounds Register. If the write would cause an OS Bounds violation, MDD toggles the OS Bounds Register and performs the central memory write commands.

Enter Bytes into Memory

Purpose The EB command changes memory one byte at a time for 1 to 33 bytes. The byte address is retained for successive memory display commands.

Format **EB**

MA=byte_address
B1...Bn

Parameters *MA*

Starting byte address (hexadecimal) to be changed. The address is the exact byte address and need not be on a word boundary. The address must be specified.

B1...Bn

The new values for the bytes starting at the byte address specified by the MA parameter. Each value is a one- or two-digit hexadecimal number. One or more bytes may be changed at a time.

Enter Central Memory

Purpose The EC command changes one word of 60-bit memory to the specified octal value. The address changed is retained for successive memory display commands.

Format **EC**

MA=word_address
WV=word_value

Parameters *MA*

The word address (octal) to be changed. The address must be specified.

WV

The new value to be entered into the address given by MA. This is a 1- to 20-digit octal value, right justified. The default for this parameter is zero.

Maintenance Register Display Commands

Display Maintenance Registers

Purpose The DR command displays either a single maintenance register, a list of consecutive registers, or a predefined list of registers in a specific element (IOU, memory, processor). On a dual IOU system, IOU0 is the only IOU which may be accessed by way of this command. The display consists of the register number (hexadecimal), the contents of the register in 16 hexadecimal digits, and a description of the register (only for the predefined list option).

Format

DR
element
RN=register_number
RC=repeat_count

Parameters *element/x*

Identifies the element from which to read the register(s). The only valid keys are: I for IOU, M for memory, and P for processor. The initial default is P. Once a value has been specified it becomes the default. On a dual IOU system, IOU0 is the only IOU which can be accessed by way of this command.

RN

Register Number to display (hexadecimal). If this parameter is omitted, the predefined list based on the element and mainframe model is used. On dual IOU systems, IOU1 registers cannot be displayed with this command.

RC

Repeat Count (hexadecimal). This parameter when specified with the RN parameter defines the number of additional registers to display. This parameter has no effect if RN is not specified.

The default registers displayed depends upon which element is specified.

Enter New Maintenance Register Value

Purpose The ER command allows the user to change the value of a register in an element on the maintenance channel. On a dual IOU system, IOU0 is the only IOU which can be accessed by way of this command.

CAUTION

Not all registers can be safely changed while an operating system is up. Some registers cannot be written by MDD for hardware reasons. The user should be familiar with the register he/she is trying to alter as mistakes can lead to unpredictable and unreliable results.

Format

ER
element
RN=register_number
RV=register_value

Parameters *element/x*

Identifies from which element to write the register. The only valid keys are: I for IOU, M for memory, and P for processor. The initial default is P or the most recently entered value. On a dual IOU system, IOU1 registers cannot be entered with this command.

RN

The required hexadecimal Register Number to change.

RV

Value to write into the register. This may be a 1- to 16-digit hexadecimal number. The value is written to the register right justified.

Clear Errors on Maintenance Element

Purpose The CE command clears errors on the specified element. On a dual IOU system, IOU0 is the only IOU which can be accessed by way of this command.

Format

CE
element

Parameters *element/x*

The element for which the Clear Errors function is executed. The only valid keys are: I for IOU, M for memory, and P for processor. The default is the most recently entered value from an ER, DR, CX, or CE command. On a dual IOU system, IOU1 errors cannot be cleared with this command.

Master Clear a Maintenance Element

Purpose The CX command master clears a specified element. On dual IOU systems, IOU0 is the only IOU which may be accessed by way of this command.

WARNING

This command should not be used if an operating system is functioning.

Format CX
element

Parameters *element/x*

The element for which the master clear function is executed. The only valid keys are: I for IOU, M for memory, and P for processor. The default is the most recently entered value from an ER, DR, CX, or CE command.

Interpret MCR Bit Settings

Purpose The MC command gives a brief description of each bit set in either the provided MCR value or from the active MCR register. If no parameter is supplied and no bits in the active MCR register are set, the user is informed that the register is clear.

Format MC
RV=mcr_contents

Parameters *RV*

The MCR Register Value to be interpreted. If not specified, the current MCR is read and its contents are used.

Interpret UCR Bit Settings

Purpose The UC command gives a brief description of each bit set in either the provided UCR value or from the live UCR register. If no parameter is supplied and no bits in the live UCR register are set, the user is informed that the register is clear.

Format UC
RV=ucr_contents

Parameters *RV*

The UCR Register Value to be interpreted. If not specified, the current UCR is read and its contents are used.

Display PP Register Values

Purpose The DP command displays the selected register for all the PPs in the IOU0. On dual IOU systems, PP register values in IOU1 cannot be displayed by way of this command. The registers are displayed as six-digit octal numbers, five to a line. The first line displays PPs 0 to 4. The second line displays PPs 5 to 11. The third line displays PPs 20 to 24 and the fourth line PPs 25 to 31. If CIO PPs are present, a fifth line displays CIO PPs 0 to 4. If a second barrel of CIO PPs is present, a sixth line displays CIO PPs 5 to 11.

Format

DP
register

Parameters *register/x*

Identifies which PP register to be displayed for each PP. The valid keys are: P for the program counter, Q for the Q register, K for current instruction, and A for the accumulator. The initial default is P or the most recently entered value.

Idle PP

Purpose The IP command idles the selected PP in IOU0 by doing a hardware idle on the PP. On a dual IOU system, PPs in IOU1 cannot be idled by way of this command. Once idled, the PP can only be restarted by way of MDD by execution of the RP command. The contents of the A register are destroyed during the restart.

Format

IP
PP=pp_number
pp_type

Parameters *PP*

PP number to idle. This must be an octal number 0 to 11 or 20 to 31. This parameter is required.

pp_type/x

The pp type is used to differentiate between NIO and CIO PPs. The only valid keys are N for NIO and C for CIO. The initial default is N or the most recently entered value.

Restart PP at Specified Address

Purpose The RP command restarts a PP in IOU by deadstarting the PP and setting a new P register. On a dual IOU system, PPs in IOU1 cannot be restarted by way of this command.

CAUTION

The deadstart load destroys words 0 and 1 as well as the contents of the A register of the specified PP.

Format **RP**

PP=pp_number
AD=starting_address
pp_type

Parameters *PP*

PP number to restart. This must be an octal number 0 to 11 or 20 to 31. The parameter is required.

AD

Address of first instruction to be executed. The address is an octal value from 0 to 7776. This parameter is required.

pp_type/x

pp_type is used to differentiate between NIO and CIO PPs. The only valid keys are N for NIO and C for CIO. The initial default is N or the most recently entered value.

Halt Processor

Purpose The HP command unconditionally halts the CPU. If used on a dual CPU system, the CPU that is halted is the one specified by the SE command. The initial default is CPU0.

CAUTION

The HP command should only be used by trained individuals that understand the hardware they are using. For example, if the user enters the HP command before entering an SD T ON command, DFT recognizes that CPU as being halted and attempts to restart it.

Format **HP**

Start Processor

Purpose The SP command attempts to restart the CPU by restarting the microcode. Depending on the reason the processor halted, this may or may not be successful. A specific microcode address may (optionally) be supplied. If used on a dual CPU system, the CPU that is started is the one specified by the SE command. The initial default is CPU 0.

Format **SP**
AD=micro_code_address

Parameters *AD*

Optional four-digit hexadecimal microcode address. If no address is supplied, the CPU is restarted from where it was stopped.

Set CPU Value

Purpose The SE command specifies which CPU is used when entering DR, ER, RF, HP, SP, DS, DK, ES, EK, CX, CE, MC, and UC commands. It also resets the MP, JP, PT, PS, and PL values on the DM command to the appropriate values for the CPU selected.

Format **SE**
CP=n

Parameters *CP*

The number of the CPU to be used for future commands which reference CPU registers. Allowed values are 0 or 1. The initial default is zero.

Display the Register File for a Processor

Purpose The RF command displays the register file for the CPU which has been previously selected by the SE command. This command is not available on CYBER 930.

NOTE

The CPU must be halted to execute this command on some models and must be running on others.

Format **RF**
AD=address
WC=word_count

Parameters *AD*

Hexadecimal register number to display. The default value is 0.

WC

The number of entries to display (hexadecimal). The default value is 10 or the most recently entered value from a DS, DK, or RF command.

DFT Commands

Display DFT Block Header

Purpose The DF command displays the DFT control block header. The DFT control block header consists of the DFT control word and the following pointer words to various buffers and tables. If DFT has not set the verified (or rejected) flag, the message NO DFT is output to the terminal.

NOTE

The address of the DFT control block or buffer of interest is saved so the next memory display command also displays this portion of memory.

Format **DF**

Parameters *None*

Display DFT Maintenance Buffer

Purpose If the MB command is entered without the BN parameter, it displays all fault symptom codes currently residing in the supportive status buffer and in the non-register status buffer (along with their corresponding sequence numbers). Since this command also displays the contents of the IOU summary status register along with the fault symptom codes, a customer engineer can obtain the status of all errors existing within a system by entering a single command.

When the MB command is entered with the BN parameter, the contents of a specific maintenance register buffer is displayed. Invalid register entries are suppressed. If DFT has not set the verified (or rejected) flag, the message NO DFT is output to the terminal.

NOTE

The address of the DFT maintenance register buffer control words or buffer of interest is saved so the net memory display command also displays this portion of memory.

Format **MB**
BN=maintenance_register_buffer_number

Parameters *BN*

Maintenance buffer number to display (0 through 10; hexadecimal). If the number is beyond the number of buffers on the specific mainframe the command terminates.

Display DFT Model Dependent Buffer

Purpose The MD command displays the three pointers to the DFT Model Dependent Buffers or if the buffer index parameter is specified, it displays one of the DFT Model Dependent Buffers. If DFT has not set the verified (or rejected) flag, the message NO DFT is output to the terminal.

NOTE

The address of the DFT Model Dependent Buffer (or the address of the pointers) is saved so that the next memory display command also displays this portion of memory.

Format **MD**
BI=buffer_index

Parameters *BI*

Specifies which specific model dependent buffer to display. Allowed values are zero, one, or two. This parameter is ignored if DFT is at version 3 or earlier.

Display DFT Non-Register Status Buffer

Purpose The NS command displays the contents of a specified non-register status buffer. If DFT has not set the verified (or rejected) flag, the message NO DFT is output to the terminal. If the BN parameter is not specified, the default is to display buffer zero.

NOTE

The address of the specified DFT Model non-register status buffer is saved so the next memory display command also displays this portion of memory.

Format **NS**
BN=non-register_status_buffer_number

Parameters *BI*

Non-register status buffer number to display (0 through 11 hexadecimal). If the number is beyond the number of buffers on the specific mainframe, the command terminates.

Set DFT Flag

Purpose The SD command can be used to instruct DFT to freeze on (or process) corrected and/or uncorrected errors or instruct DFT to ignore errors. If DFT is instructed to freeze on corrected and/or uncorrected errors, and if the appropriate error occurs, DFT halts all processors, logs errors and waits until instructed to again process errors. It then clears the registers and restarts all processors. If instructed to ignore errors, DFT stops reading maintenance registers, thereby ignoring any errors until instructed to again look for errors. If DFT has not set the verified flag, the message `DFT NOT VERIFIED` is output to the terminal. The command has various formats, depending on the action code specified.

NOTE

The SD T ON command results in any errors that occur being ignored. If DFT is at version 4 or earlier, the user must enter both the SD U ON and the SD C ON commands to instruct DFT to halt all processing when any error occurs. If DFT is at version 5 or later, the most recently entered SD command overrides any previously entered command. The user must enter SD A ON to instruct DFT to halt all processing when any error occurs. Note also that at DFT version 5 or later, the use of the UE/WE commands overrides any SD command (and vice versa).

Format

SD
error_type
DFT_action

Parameters *error_type/x*

This keyword indicates what error processing DFT should do. The allowed values of U for uncorrected errors and C for corrected errors cause DFT to process errors as indicated above if the DFT action is set to ON or to continue normal processing if the DFT action is set to OF. The value A causes DFT to process all errors (corrected and uncorrected) as described above if the DFT action is set to ON and to process all errors normally if the DFT action is set to OF. See the note above for more information regarding the use of A vs. U/C at various levels of DFT. The value T causes DFT to ignore errors if the DFT action is set to ON. The default is initially T. The default changes when a new value is entered.

DFT_action/x

The ON keyword sets the DFT flag and the OF keyword clears the flag. The initial default is OF. The default changes when a new value is entered.

Set DFT Error Control Data

Purpose

The UE (Update DFT error control data), DE (display DFT ECR element) and WE (write DFT ECR element) commands can be used to isolate specific hardware errors in a system element. A system element is an IOU, CPU, or central memory. The error control data is stored in the ECR (Error Control Record) for the element and it tells DFT to freeze on or process specific errors. Error control data can be very general; for example, stopping the system on any error or ignoring all errors (similar to the SD command). It can also be very specific; for example, freezing the system when a certain bit of a PFS register in a certain element is set.

Typically, the UE command would first be entered to specify an element and an action code. Other formats of the UE command would then be used to enter the parameters (register numbers, register values, and masks) required by a specific action code. As the data is entered, it is stored in a central memory buffer. The DE command can be used to display the data that has been entered thus far. After all of the required data has been entered, the WE command is executed to tell DFT to update its copy of the ECR from the CM buffer. DFT also updates the copy of the ECR on the CIP device. Once the WE command is entered, the error control data remains in effect until it is changed through another series of UE/DE/WE commands or through the SD command or CIP is reloaded.

If DFT has not set the verified flag, the message `DFT NOT VERIFIED` is output to the terminal. These commands are valid only if DFT is at version 5 or later.

NOTE

These commands should be used only by knowledgeable persons who are familiar with the command and the DFT OS Interface Specification. Incorrect or incompletre entry of data could result in undesirable system halts.

Update DFT Error Data

Purpose

The UE command sets error control data on any system element. The command has various formats to enter the parameters required by the specified action code.

NOTE

An action code=1 causes all errors that occur in a particular element to be ignored. In order to cause DFT to halt all processing when any error occurs, the user must enter an action code=2 for all elements. Use of the SD command overrides any UE/WE commands that were previously entered (and vice versa).

Format

UE

EI=element_id AC=action_code
EI=element_id RA=register_number RV=register_value
EI=element_id MA=register_mask
EI=element_id RB=register_number RV=register_value
EI=element_id MB=register_mask

Parameters

AC

A decimal ordinal from 0 to 18 which describes what action DFT is to take. There is no default for this parameter.

0 Process all errors.
1 Ignore all errors.
2 Freeze on any error.
3 Freeze on any corrected error.
4 Freeze on any uncorrected error.
5 Freeze on RA bit range.
6 Freeze on RA specific bits.
7 Freeze on RA bit range and RB bit range.
8 Freeze on RA bit range and RB specific.
9 Freeze on RA specific and RB bit range.
10 Freeze on RA specific and RB specific.
11 Ignore corrected error.
12 Ignore uncorrected error.
13 Ignore RA bit range.
14 Ignore RA specific bits.
15 Ignore RA bit range and RB bit range.
16 Ignore RA bit range and RB specific.
17 Ignore RA specific and RB bit range.
18 Ignore RA specific and RB specific.

EI

This required parameter is a numeric value which corresponds to a system element.

00 CPU0
10 CPU1
02 IOU0
12 IOU1
01 Central memory

RA

This parameter is the hexadecimal number of a register within the specified element. There is no default for this parameter.

RB

This parameter is the hexadecimal number of a register within the specified element. There is no default for this parameter.

RV

This is a 64-bit hexadecimal value to be stored in the specified register. There is no default for this parameter.

MA

A logical AND will be performed between this 64-bit hexadecimal value and the RA register. There is no default for this parameter.

MB

A logical AND will be performed between this 64-bit hexadecimal value and the RB register. There is no default for this parameter.

Display Element

Purpose The DE command displays the error control data that has been entered into the CM buffer for a specific element.

Format **DE**
EI=element_id

Parameters **EI**

This required parameter is a numeric value which corresponds to a system element.

00	CPU0
10	CPU1
02	IOU0
12	IOU1
01	Central memory

Write Element

Purpose The WE command tells DFT to write its copy of the ECR and the copy on the CIP device from the CM buffer.

Format **WE**

Parameters **None**

Display DFT Structure

Purpose The DD command displays any DFT structure. Only the data is displayed, no interpretation is performed.

Format **DD**
structure

Parameters **structure/x**

This keyword indicates which DFT structure should be displayed; the default is BC. If the specified structure is undefined (length=0), MDD responds with ZERO BUFFER LENGTH.

SI	SECDED ID table.
MR	Maintenance register buffer.
NV	NOS/VE request pointers.
PR	C170 PP resident buffer.
BC	Buffer control words.
ME	Mainframe element counters.
EC	Error control record.
SS	Supportive status buffer.
NS	Non-register supportive status buffer.
CM	Central memory resident.
PS	PP register save area.
SD	Secondary DFT buffer.

Control Store Commands

Display Eight-Byte Control Store

Purpose The DS command displays 64-bit control store. This command is only valid if your computer system is a CDC CYBER 994.

NOTE

The processor must be halted to execute this command.

Format

DS
AD=address
TC=type_code
WC=word_count

Parameters *AD*

The four-digit hexadecimal address to begin displaying the control store memory. The default is 0 or the most recently entered value from an DS, DK, ES, EK, DFT command, or memory command.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

WC

The number of words of control store to display. The default value is 10 or the most recently entered value from a DB, DC, DH, DS, DK, or RF command.

Display Sixteen-Byte Control Store

Purpose The DK command displays 128-bit control store. This command is only valid if your computer system is a CDC CYBER 994.

NOTE

The CPU must be halted to execute this command.

Format

DK
AD=address
TC=type_code
WC=word_count

Parameters *AD*

The four-digit hexadecimal address to begin displaying the control store memory. The default is 0 or the most recently entered value from an DS, DK, ES, EK, DFT command, or memory command.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

WC

The number of words of control store to display. The default value is 10 or the most recently entered value from a DB, DC, DH, DS, DK, or RF command.

Enter Eight-Byte Control Store

Purpose The ES command changes a word in 64-bit control store. The new values are to be entered byte-wise and are entered left justified. This command is only valid if your computer system is a CDC CYBER 994.

NOTE

The CPU must be halted to execute this command.

Format

ES
AD=address
TC=type_code
B1...Bn

Parameters *AD*

The four-digit hexadecimal address to begin displaying the control store memory. This parameter is required.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

B1...Bn

The new values for the bytes starting at the byte address specified by the AD parameter. Each value is a one- or two-digit hexadecimal number. One or more bytes may be changed at a time.

Enter Sixteen-Byte Control Store

Purpose The EK command changes a word in 128-bit control store. The new values are to be entered byte-wise and are entered left justified. This command is only valid if your computer system is a CDC CYBER 994.

NOTE

The CPU must be halted to execute this command.

Format **EK**
AD=address
TC=type_code
B1...Bn

Parameters *AD*

The four-digit hexadecimal address to begin displaying the control store memory. This parameter is required.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

B1...Bn

The new values for the bytes starting at the byte address specified by the AD parameter. Each value is a one- or two-digit hexadecimal number. One or more bytes may be changed at a time.

Miscellaneous Commands

Return MDD PP to the Operating System

Purpose The BY command causes MDD to give up the communications port and return the PP to the operating system if no other SCI mode is active (for example, SCD). MDD must then be started from the operating system console.

The BY command causes MDD to write into word DFCM+10 in the Environmental Interface Control Block (if at least at Level 4) the following status.

Bit	Meaning
0-15	RFU.
16-31	Number of SCI overlays that were actually loaded from CM.
32-47	Number of times MDD wrote CM.
48-63	Number of times MDD wrote Maintenance Registers.

NOTE

If MDD was initiated by CIP in a dual state environment, this command, enters the values described above, responds with `*ILL*` and MDD continues to function normally.

Format **BY**

Set Refresh Mode

Purpose MDD can be run in a refresh mode that allows the user to watch registers or memory change. In refresh mode, MDD outputs an 18 (hexadecimal) and a 0C (hexadecimal) to clear the screen for most CRT terminals. The terminal should be in page mode; when operating in this refresh mode, the cursor homes to lower left.

Format **SR**
mode

Parameters *mode/x*

ON sets MDD to display in refresh mode and OF sets the refresh mode off. The initial default value is off.

Set Refresh Rate

Purpose If MDD is operating in refresh mode, the RR command allows the user to set the refreshing rate faster or slower. This allows the user to adjust the refreshing rate to his/her needs by repeating this command.

Format **RR**
change

Parameters *change/x*

This parameter has two values. FA causes the displays to be updated more rapidly and SL slows down the refreshing rate. The initial default is FA.

Display MDDs Commands

Purpose The HE command allows the user to see a brief explanation of all of the commands which are available. If the command parameter is specified, MDD displays the syntax for that command. To accommodate different screen sizes, a pause is inserted into the output of the command list to allow the user time to read the information. Pressing any key at this time causes the list to continue.

Format **HE**
command

Parameters *command*

When this optional parameter is entered, MDD displays the syntax for the desired command. If an invalid command name is entered, MDD responds with `*ILL*` (see Other Messages to the Terminal).

ESC Key

Purpose The ESC key allows the user to terminate the input of a command. When MDD receives a 1B (hexadecimal), it terminates any input it has received, outputs the message `*ILL*`, and waits for new input.

Other Messages to the Terminal

Message	Cause of Message
CHANNEL 17 HUNG	MDD shares the maintenance channel with other utilities. If this channel is hung and MDD is unable to access it, the message CHANNEL 17 HUNG appears. When this happens, all commands which access this channel no longer function.
CLEARED	After MDD does a master clear (CX) of an element, the message CLEARED is displayed.
CPU Halted	MDD has halted the currently selected CPU.
CPU must be Halted to access Control Store	Execute a DS, DK, ES, or EK command the CPU must be halted.
CPU Started	MDD has started the currently selected CPU.
CPU x	MDD has set the default CPU to the value indicated by x.
CPU 0	Value for a nonexistent CPU. MDD has reset to the default CPU of 0.
CPU # not found	The SE command was given with a CP parameter.
Deadman Timeout	MDD has encounted an error while it was attempting to read or write a maintenance register.
DFT NOT VERIFIED	DFT has rejected the DFT block. The SD command will not function.
ECR UPDATED	MDD has completed the update of the specified DFT error control record.
ELEMENT ID NOT FOUND	MDD could not find the specified element ID.
ERROR	MDD has encountered an error while it was attempting to read or write a maintenance register.
ERROR Handling inactive	MDD has set the desired flag in the DFT Control Word.
ERROR Handling active	MDD has cleared the desired flag in the DFT Control Word.
IGNORED	If the user wishes to abort a command, he/she may press the **ESC** key. MDD then ignores the previous input. Or the **F7** key has been pressed and no other driver has signaled a request for the port.

Message Center	Cause of Message
ILL	If the user enters a command which MDD does not recognize or uses improper syntax, MDD responds with *ILL*. The previous input is ignored and the user should enter the proper command and syntax. MDD also follows this protocol if it detects a character it does not recognize (for example, @). If the user wants to abort a command he may press the **Esc** key. MDD responds *ILL* and ignores the previous input.
MDD Level xx Copyright CONTROL DATA 1989	Each time MDD acquires access to the terminal via the two port multiplexer this message is displayed. This permits the user to confirm that he/she is communicating with MDD. The xx after the word level is incremented for each update to MDD.
MEMORY WRITE WOULD CROSS OS BOUNDS	An attempt to execute an EB or EC command would cause MDD to violate the OS Bounds register. The user should enter the AB command and try again.
MR ERROR	MDD has encountered an error while trying to access channel 15.
NO DFT	The DFT PP has not verified (or rejected) the DFT control block. The DF and SD commands do not execute.
OS BOUNDS toggled for MDD	The next execution of an EB, EC, or SD command allows MDD to reset its side of the OS Bounds register if needed.
PAGE MISSING	MDD has searched the Page Table for an address specified by a DM command and has not found the page in central memory.
PP HALTED	Indicates MDD has halted a PP.
Press any key for more HELP	The listing of the commands available to MDD has been suspended. Any key pressed causes the output to continue.
PROCESSOR HALTED	MDD has halted the currently selected CPU.
Processor MUST be HALTED to read Control Store	To execute a DS or DK command the processor must be halted.
Processor MUST be HALTED to write control store	To execute a ES or EK command the processor must be halted.
PROCESSOR STARTED	MDD has started the currently selected CPU.
SEGMENT MISSING	The segment number provided on a DM command is either invalid or has an invalid ASID.

Message Center	Cause of Message
WRITE WOULD CROSS MEMORY BOUNDS	An attempt to execute an EB or EC command would cause MDD to violate the Memory Bounds register. The user must know how to enable write and try again.
ZERO BUFFER LENGTH	The DD command was executed for a structure with a zero length; therefore, it could not be displayed.

Error Log/Dayfile Messages

Message	Cause of Message
MDD - ALREADY ACTIVE.	There is already a copy of MDD executing in a PP. A "BY" command must be issued to that copy before a new one can be initiated.
MDD - CONSOLE MUST BE UNLOCKED.	An attempt was made to bring MDD up when the operators console was in a locked state. The operator should unlock the console. MDD will drop out. An alert status is sent.
MDD - IMPROPER ACCESS ATTEMPT.	MDD was not initiated with the proper validation. MDD will drop out. On NOS an alert status is sent.
MDD - MR ERROR.	A maintenance register error was detected at itialization time. MDD will drop out. If no PPs are hung, the operator should attempt to bring MDD up again.
MDD - NOT ALLOWED ON THIS MAINFRAME.	MDD will only run in a CYBER 170-8xx mainframe (865-875 excluded), 180-8xx mainframe, or a 180-9xx mainframe. MDD will drop out. On NOS an alert status is sent.
MDD - SCI NOT FOUND IN CIP DIRECTORY.	MDD has searched the central memory CTI directory and has not found the resident version of SCI. The CIP level is less than 7. MDD will drop out. On NOS an alert status is sent.
MDD - VALIDATED.	MDD has successfully validated itself and begun operation.
MDD - MUST BE INITIATED FROM NOS/VE.	When NOS/VE is active in a dual state environment, MDD cannot be initiated from the 170 side. It must be brought up on the 180 side. MDD could be initiated from the 170 side before NOS/VE is deadstarted.

Examples of MDD Command Usage

```
dr i
0 0000000000000000 SS
12 0000FFFAFFFF0F07 OI
18 0000000000000000 MASK REGISTER
21 1F1F1F1F000007FE OS BOUNDS
30 0000000000000009 EC
40 0000000000008800 STATUS
80 0000000000000000 FS1
81 0000000000000000 FS2
A0 0000000000000003 TM
```

Display register with default IOU registers.

```
dr m
00 0000000000000000 SS
12 0041000000000000 OI
20 0100000002000000 EC
21 400000000bf60000 MEM BOUNDS
A0 0000000000000000 CEL
A4 0000000000000000 UEL1
A8 0000000000000000 UEL2
```

Display register with default memory registers.

```
er m 21 0
21 0000000000000000
```

Disable Memory Bounds.

```
er m 21 400000000bf60000
21 400000000bf60000
```

Restore Memory Bounds.

```
dr p 61
61 0000000000FF8270
```

Display register 61 of the processor.

```
dm pva=500000000 mps wc=5
* SEGMENT *005
00000000  00 00 18 00 00 10 81 20
00000008  90 00 00 00 09 09 19 83
00000010  00 00 03 40 00 00 00 18
00000018  00 00 00 02 00 FF 89 D0      p
00000020  8D 01 00 4A 0E 12 AC DF   J  ,
```

Display the first five words of EI.

```
db
000FFA000  00 00 18 00 00 10 81 20
000FFA008  90 00 00 00 09 09 19 83
000FFA010  00 00 03 40 00 00 00 18
000FFA018  00 00 00 02 00 FF 89 D0      p
000FFA020  8D 01 00 4A 0E 12 AC DF   J  ,
```

Display the same memory with the DB command.

```
dh
01FF400  0000180000108120
01FF408  9000000009091983
01FF410  0000034000000018
01FF418  0000000200FF89D0      p
01FF420  8D01004A0E12ACDF   J  ,
```

Display the same memory with the DH command. Note: the display address is given by word address instead of byte address.

```
dc
007772000  0000600000004100440     F   DHDI
007772001  0000000001102214601         IBQ A
007772002  0000064000000000030             X
007772003  0000001000777704720     H       P
007772004  6401000450160452601 7   A D ND    O
```

Display the same memory with the DC command.

```
dh,17EF65,4
017EF65  00000000000AD870    p
017EF66  0100100100000B28    (
017EF67  00FF100100000B28    (
017EF68  FE00FFFF80000000
```

Display four words of memory in hexadecimal word format. Note: The display address is given by word address.

```
+
017EF69  00001E070000F7C0   w
017EF6A  0000100000010200
017EF6B  0000100000000180
017EF6C  0000100000000000
```

Advance to the next block of memory.

```
db wc=1 ma=bf7b29
0BF7B28  00 00 10 00 00 0A 08 70  p
```

Display one word in byte format. Note: Address was rounded down.

```
+30
0BF7B58  00 00 10 00 00 00 01 80
```

Advance the display by 30 (hexadecimal) bytes.

```
-B58
0BF7000  90 00 00 13 00 10 41 07
```

Display memory b58 bytes lower in memory.

```
eb bf7003 1 2 3b 4
```

Change memory byte-wise.

```
db
0BF7000  90 00 00 01 02 3B 04 07
```

Display memory just changed.

```
mc
MCR = CLEAR
```

Display current MCR register flags.

```
mc 8010
MCR = DUE, SIT,
```

Display bit definitions for MCR.

```
uc 9000
UCR = PRIV FAULT, PIT
```

Display bit definitions for UCR.

```
dp a
A REG
004000 000073 000127 000145 000153
000154 000001 000147 006421 005510
000022 000001 000002 000056 004276
001460 173542 004563 777771 003551
```

Display PP A registers.

```
he rr                                          Display the syntax for the
RR [FA/SL]                                     RR command.
he
DB  DISPLAY MEMORY C180-BYTE
DC  DISPLAY MEMORY C170-WORD
DH  DISPLAY MEMORY C180-WORD                   Display a list of commands.
DM  DISPLAY VIRTUAL MEMORY
EB  ENTER HEX BYTE[S]
EC  ENTER A C170 WORD
DR  DISPLAY REGISTER CONTENTS
ER  ENTER REGISTER CONTENTS
RF  DISPLAY REGISTER FILE
DK  DISPLAY CONTROL STORE
DS  DISPLAY CONTROL STORE
EK  ENTER CONTROL STORE
ES  ENTER CONTROL STORE
CE  CLEAR ERROR ON PORT
CX  MASTER CLEAR PORT
HP  HALT PROCESSOR
SE  SET CPU VALUE
SP  START CONTROL STORE
MC  EXPLAIN MCR BITS
UC  EXPLAIN UCR BITS
DP  DISPLAY PP REGISTER
IP  IDLE PP
Press any key to continue.
q                                              (Any key entered from terminal.)
RP  RESTART PP AT A SPECIFIED ADDRESS
DF  DISPLAY DFT HEADER
MB  DISPLAY DFT MAINTENANCE REGISTER BUFFER
MD  DISPLAY DFT MODEL DEPENDENT BUFFER
NS  DISPLAY DFT NON-REGISTER STATUS BUFFER
DD  DISPLAY DFT STRUCTURE
SD  SET DFT STATE FOR ERROR ACTIONS
UE  UPDATE DFT ECR ELEMENT
DE  DISPLAY DFT ECR ELEMENT
WE  WRITE ELEMENT
RR  SET REFRESH RATE
SR  SET REFRESH
BY  RETURN MDD PP
```

Display the DFT Control Block Header (version 3)

```
df

0701030119030080  DFT Control Word
0022000000020008  SECDED ID Table PTR.
002A0000000201A9  Maintenance Reg. Buffers PTR.
0000000000000000  Model Dependent Buffer PTR.
003300030E800004  NOS/VE Buffer PTR.
0000000000000000  C170 PP Resident Buffer PTR.
0000000000000000  C170 OS Request PTR.
DFT = DFT VERIFIED,
```

Display the DFT Control Block Header (version 7)

```
df

0F0107041E110080  DFT Control word
002E00000042000A  SECDED ID Table PTR.
003A0000004201FE  Maintenance Reg. Buffers PTR.
000B000000570003  Model Dependent Buffer PTR.
003400070D200004  NOS/VE Buffer PTR.
0000000000000000  C170 PP Resident Buffer PTR.
00350000006D0001  C170 OS Buffer PTR.
003A0000004A0001  MR Buf. Control Words Buffer PTR.
000D0000004B0006  MF Element Counter Buffer PTR.
00150000004B0025  DFT Control Info. Buffer PTR.
003C0000004B0078  Supportive Status Buffers PTR.
00360000004D00BC  Non-Register Status Buffer PTR.
0034000000500064  DFT Central Memory Resident PTR.
001A0000005200F1  PP Register Save Area PTR.
000D000000056003C  Secondary DFT Buffer PTR.
DFT = DFT VERIFIED,
```

Display DFT Maintenance Buffer

```
mb
MR Buff. Control Words          Non-Reg. Status Buffers
Index  Seq #  FSC              Index  Seq #  FSC

01     01     DI40007
02     02     DI40007
03     03     DI40007          03     22     DI40Z617
04     04     DI40007
05     05     DI40007
06     06     DI40007

0000000000000000   IOU SS

mb 1
TOP OF HOUR MAINFRAME ELEMENT COUNTERS
ELEMENT     ULOG CORR UCOR
CPU-0     - 0000 0000 0000
CPU-1     - 0000 0000 0000
IOU-0     - 0000 0000 0000
MEMORY-0  - 0000 0000 0000
```

```
sd t on
Error Handling INACTIVE

sd t of
Error Handling ACTIVE
se 1
CPU 1.

se 3
CPU # not found
CPU 0.
```

```
by                                    This response comes from the CIP
*ILL*                                 version.

hp
CPU HALTED

sp
CPU STARTED
```

```
EB 345F8 44 33 4?*ILL*                Illegal character entered by
                                      mistake.
```

This series of commands could be used to instruct DFT to freeze on a specific bit range in CPU0 register 80. The example requests that DFT freeze if any bit 8 through 15 is set.

```
UE EI=00 AC=5                         Set up the error control data.
UE EI=00 RA=80 RV=00FF000000000000
UE EI=00 MA=00FF000000000000
WE                                    Write the updated ECR record.
```

This series of commands could be used to instruct DFT to freeze on bit 24 in PFS register 82 in CPU1.

```
UE EI=10 AC=6                         Set up the error control data.
UE EI=10 RA=82 RV=0000008000000000
UE EI=10 MA=0000008000000000
WE                                    Write the updated ECR record.
```

This series of commands could be used to instruct DFT to freeze when bits 1 AND 3 are set in CPU0 register 80 AND any bit 48 through 51 OR 53 through 55 in CPU0 register 83 is set (ignore bit 52).

```
UE EI=00 AC=9                         Set up the error control data.
UE EI=00 RA=80 RV=5000000000000000
UE EI=00 MA=0000008000000000
UE EI=00 RB=83 RV=000000000000F700
UE EI=00 MB=000000000000F700
WE                                    Write the updated ECR record.
```

Registers Displayed by MDD

For the IOU, the following are displayed and labeled accordingly.

```
00 xxxxxxxxxxxxxxxx SS
12 xxxxxxxxxxxxxxxx OI
18 xxxxxxxxxxxxxxxx MASK REG
21 xxxxxxxxxxxxxxxx OS BOUNDS
30 xxxxxxxxxxxxxxxx EC
40 xxxxxxxxxxxxxxxx STATUS
80 xxxxxxxxxxxxxxxx FS1
81 xxxxxxxxxxxxxxxx FS2
A0 xxxxxxxxxxxxxxxx TM
```

The following CIO registers are also displayed.

```
16 xxxxxxxxxxxxxxxx OI
1C xxxxxxxxxxxxxxxx MASK REG
25 xxxxxxxxxxxxxxxx OS BOUNDS
34 xxxxxxxxxxxxxxxx EC
44 xxxxxxxxxxxxxxxx STATUS
84 xxxxxxxxxxxxxxxx FS1
85 xxxxxxxxxxxxxxxx FS2
A4 xxxxxxxxxxxxxxxx TM
B0 xxxxxxxxxxxxxxxx C-CH 0
B1 xxxxxxxxxxxxxxxx C-CH 1
B2 xxxxxxxxxxxxxxxx C-CH 2
B3 xxxxxxxxxxxxxxxx C-CH 3
B4 xxxxxxxxxxxxxxxx C-CH 4
B5 xxxxxxxxxxxxxxxx C-CH 5
B6 xxxxxxxxxxxxxxxx C-CH 6
B7 xxxxxxxxxxxxxxxx C-CH 7
B8 xxxxxxxxxxxxxxxx C-CH 8
B9 xxxxxxxxxxxxxxxx C-CH 9
```

For memory, the defaults are:

```
00 xxxxxxxxxxxxxxxx SS
12 xxxxxxxxxxxxxxxx OI
20 xxxxxxxxxxxxxxxx EC
21 xxxxxxxxxxxxxxxx MEM BOUNDS
A0 xxxxxxxxxxxxxxxx CEL
A4 xxxxxxxxxxxxxxxx UEL1
A8 xxxxxxxxxxxxxxxx UEL2
```

For the CPU, the following list is displayed for all mainframes.

```
00 xxxxxxxxxxxxxxxx SS
30 xxxxxxxxxxxxxxxx DEC
31 xxxxxxxxxxxxxxxx S
40 xxxxxxxxxxxxxxxx P
41 xxxxxxxxxxxxxxxx MPS
42 xxxxxxxxxxxxxxxx MCR
43 xxxxxxxxxxxxxxxx UCR
48 xxxxxxxxxxxxxxxx PTA
49 xxxxxxxxxxxxxxxx PTL
4A xxxxxxxxxxxxxxxx PSM
```

```
51 xxxxxxxxxxxxxxxx MDW
61 xxxxxxxxxxxxxxxx JPS
62 xxxxxxxxxxxxxxxx SIT
80 xxxxxxxxxxxxxxxx PFS
```

Appendixes

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Glossary A

A

Address

The location of a word in memory. The location is designated by number or symbolic name.

Alphanumeric Characters

The letters of the alphabet (A through Z) and the digits (0 through 9).

B

Binary File

A noneditable file that contains a precompiled program.

C

Cache

A high-speed memory that resides in the central processor.

CAU

Refer to Common Disk Area Utility (CAU).

CDA

Refer to Common Disk Area (CDA).

Central Memory (CM)

The main storage device whose storage cells (words) can be addressed by a computer program and from which instructions and data can be loaded directly into registers. The instructions can be executed and the data can be manipulated from these registers.

Central Memory Flaw Table (CFT)

File name where central memory flaw data is stored.

Central Memory Resident (CMR)

The low address area of central memory reserved for tables, pointers, and subroutines necessary for operation of the operating system. It is never accessible to a user's central processor program. The remainder of central memory is allocated by monitor to jobs as they are selected on a priority basis for execution.

Central Processor Unit (CPU)

The high-speed arithmetic unit that performs the addition, subtraction, multiplication, division, incrementing, logical operations, and branching instructions needed to execute programs.

CFT

Refer to Central Memory Flaw Table.

Channel Number

The number of the data channel on which a peripheral device controller can be accessed.

CIP

Refer to CYBER Initialization Package.

CM

Refer to Central Memory.

CMR

Refer to Central Memory Resident.

CMRDECK

A deadstart text deck used by the NOS operating system to configure the system.

CMSE

Refer to Common Maintenance Software Executive.

CMU

Refer to Compare/Move Unit.

Coldstart

Procedure used to deadstart if the tape or disk controller has not yet been loaded with controlware or the controlware is not running.

Common Disk Area (CDA)

The disk storage area that contains a default parameter block, EI, microcode, SCD, MDD, and CEL.

Common Disk Area Utility (CAU)

The utility program CTI uses to install default parameters, EI, SCD, MDD, and microcode in the common disk area.

Common Maintenance Software Executive (CMSE)

The MSL executive program.

Common Test and Initialization (CTI)

Common deadstart process used to load the operating system and MSL. CTI is one of the modules provided on the CIP tape.

Compare/Move Unit (CMU)

The hardware that executes the CPU instructions for moving and comparing data fields consisting of strings of 6-bit characters.

Confidence Level Testing (CYBER 994 only)

Testing done by CTI, HIVS, long deadstart sequence and extended deadstart sequence. These programs enter data in different parts of memory and then check to see if the patterns hold.

Controller

Hardware device that connects channels to peripheral devices. For example, a tape controller might connect up to eight tape units to one channel.

Controlware

A special type of software that resides in a peripheral controller. The controlware defines the functional characteristics of the controller. Also referred to as peripheral microcode.

CPU

Refer to Central Processor Unit.

CTI

Refer to Common Test and Initialization.

CYBER Initialization Package (CIP)

A release mechanism that provides CTI, HIVS/MSL, EI, SCD, MDD, and microcode on a single tape.

D

Deadstart

The process of initializing the system by loading peripheral microcode, components of the CIP tape, and the operating system. Coldstart and warmstart are two forms of deadstart.

Deadstart Error Log (DEL)

Log where fatal errors are stored by CTI during confidence testing.

Dedicated Fault Tolerance (DFT)

Software package that controls error handling for CYBER mainframes.

Default

A system-supplied value used when you do not supply the value.

Default Parameter Block (DPB)

The memory block where the default deadstart parameters are stored.

Delimiter

A character used to separate statement elements, such as words and literal constants, or other strings of text.

Device

A tape or disk unit used during system deadstart or for utility operations.

DFT

Refer to Dedicated Fault Tolerance.

DPB

Refer to Default Parameter Block.

DSD

Refer to Dynamic System Display.

Dump

The process of transferring the contents of memory and registers to tape or to a printer for analysis.

Dynamic System Display (DSD)

The operating system program that provides communication between the operator and the system by accepting control information typed on the console keyboard and by displaying to the operator information pertinent to all jobs known to the system. DSD is permanently assigned to peripheral processor 1.

E

EDD

Refer to Express Deadstart Dump.

EI

Refer to Environment Interface Program.

Environment Interface Program (EI)

EI is a component of CIP for models 810 through 860 and 990.

EQPDECK

A deadstart text deck that is used to describe the hardware configuration to the NOS operating system.

Equipment Number

A number from 0 to 7 that identifies the setting on a peripheral device controller.

Equipment Status Table (EST)

A table built and used by the NOS operating system. A list of all peripheral devices connected to the system. Each table entry indicates the status of a particular device. EST resides in CMR.

EST

Refer to Equipment Status Table.

Express Deadstart Dump (EDD)

A utility that may be run at deadstart time after a system malfunction has occurred. It generates the express deadstart dump file on magnetic tape.

Express Deadstart Dump (EDD) File

File that is generated on magnetic tape by the express deadstart dump utility. This file contains memory, hardware registers, and controller memory.

Extended Memory

An additional portion of memory available as an option. This memory can be used for program and data storage, but not for program execution. Special hardware instructions exist for transferring data between central memory and extended memory. Extended memory consists of either extended core storage (ECS), large central memory extended (LCME), extended semiconductor memory (ESM and STORNET), or unified extended memory (UEM).

F

FCA

Refer to Field Change Announcement.

Field Change Announcement (FCA)

A chart that communicates the levels of maintenance software, hardware, CYBER Initialization Package, and operating system that have been tested and certified by Control Data to function together correctly.

Field Length (FL)

The number of memory words assigned to a program.

File Name Table (FNT)

A system-managed table that contains the local file name, the file type of all active files in the system, and other job control information. Relates only to the NOS operating system.

File Status Table (FST)

A system-managed table that contains information pertaining to a file's location on mass storage and other job control information. Each active file in the system has an FST entry. Refer also to File Name Table. Relates only to the NOS operating system.

FL

Refer to Field Length.

FNT

Refer to File Name Table.

FST

Refer to File Status Table.

H

Hardware Initialization and Verification Software (HIVS)

The software package that assists CTI during deadstart. It includes the Hardware Verification Sequencer (HVS) that provides deadstart confidence-level testing.

HIVS

Refer to Hardware Initialization and Verification Software.

HIVS-TDX

The tape-to-disk utility used to build HIVS on a disk from tape.

I

IOU

Input/output unit. IOU is a collection of all PPs, PP channels, and related hardware.

M

Mainframe Reconfiguration Table (MRT)

File name where mainframe reconfiguration data is stored.

Maintenance Software Library (MSL)

A set of tests, diagnostics, and utility programs that test system components, isolate malfunctions, and monitor machine states. MSL executes off-line to the operating system.

MDD

Refer to Monitor Display Driver.

Microcode

Programs residing in control memory or control memories that cause the hardware to execute the product set or diagnostic operations. Microcode is a component of CIP for CYBER 960, 970, and 994 computer systems.

Monitor Display Driver (MDD)

A program that monitors maintenance registers during operating system operation.

MRT

Refer to Mainframe Reconfiguration Table.

MSL

Refer to Maintenance Software Library.

Multimainframe System

A network of physically and logically connected computer systems.

N

NOS

Network Operating System. A standard operating system for a CYBER 960, 970, or CYBER 994 computer system.

NOS/BE

Network Operating System/Batch Environment. A standard operating system for a CYBER 960, 970, or CYBER 994 computer system. It controls the execution of programs submitted through remote terminals and maintains normal batch processing operations for jobs submitted locally.

NOS/VE

Network Operating System/Virtual Environment. A standard operating system for a CYBER 960, 970, or 994 computer system. In addition to having all the capabilities of NOS, NOS/VE also uses virtual memory.

O

Operating System (OS)

The set of system programs that controls the execution of computer programs and provides scheduling, error detection, input/output control, accounting, compilation, storage assignment, and other related services.

OS

Refer to Operating System.

P

Performance Monitor Facility Register (PMF)

A hardware register used to record system performance. Sometimes referred to as the Performance Environment Monitor Register (PEM).

Peripheral Processor (PP)

The hardware unit within the host computer that performs physical input and output through the computer's data channels.

Permanent File

A mass storage file that is cataloged by the system so its location and identification are always known to the system. They are protected by the system from unauthorized access according to privacy controls specified when they are created.

PMF

Refer to Performance Monitor Facility Register.

PP

Refer to Peripheral Processor.

R

RA

Refer to Relative Address.

RCM

Refer to Restore Central Memory (RCM) Utility.

Relative Address (RA)

The absolute machine address in central memory of the first word of a loaded program.

Restore Central Memory (RCM) Utility

The utility that restores central memory from an Express Deadstart Dump (EDD) dump as part of an operating system recovery sequence.

S

SCD

Refer to System Console Driver.

SCI

Refer to System Control Interface.

SI Tape

Refer to System Internal Tape.

SRT

Sector Reservation Table.

System Console Driver (SCD)

An operating system program that provides an interface between the operating system and a CC634B display terminal and a CC598B system console connected to a two-port multiplexer.

System Control Interface

CIP module containing VPB, SCD and MDD programs.

System Internal (SI) Tape

A magnetic tape with fixed length physical record units of 128 decimal central memory words for coded tape and 512 decimal central memory words for binary tape. An SI tape can be labeled or unlabeled, and written on seven-track or nine-track tape.

T

TDX

The tape-to-disk transfer utility used to build MSL on a disk from tape.

U

UEM

Refer to Unified Extended Memory.

Unified Extended Memory (UEM)

A type of extended memory that is available as an option for CYBER 960, 970, and 944. UEM differs from other types of extended memory in that it is a portion of central memory and not a separate memory unit. Refer to Extended Memory. Relates only to NOS operating system.

Unit Number

A number that identifies a hardware device. Used to identify a hardware device when more than one device can be connected to a controller.

V

Virtual Processor Boot (VPB)

An operating system boot program that provides interface between the operting system and the display terminal.

VPB

Refer to Virtual Processor Boot.

W

Warmstart

Procedure used to deadstart if the tape or disk controller is loaded and the controlware is running.

Write Ring

A circular device inserted into a tape reel indicating to the tape unit that it can write on that reel. The operating system checks for the presence of a write ring if you request it.

CIP Error and Informative Messages B

This appendix contains an alphabetical listing of the error and informative messages that may appear during a CIP operation. All messages are sorted according to the first nonvariable word or character. Messages beginning with special characters (such as hyphens or asterisks) are sorted as if the special characters were not present.

Messages issued by MSL are not included here. See the appropriate MSL reference manual.

Message	Description	Reporting Module
ALL CPUS OFF, OS LOAD IMPOSSIBLE	At least one CPU must be turned on for the OS load to proceed.	CTI
CC545A CONSOLE CANNOT BE USED FOR THE OS DEADSTART SELECTED	An attempt was made to bring up NOS/VE from a CC545. You must use a CC598B console.	CTI
CENTRAL PROCESSOR(S) NOT ACCESSIBLE VIA MAINTENANCE CHANNEL. DEADSTART AND SELECT OPTIONS U,I,U,E TO OBTAIN EXPRESS DEADSTART DUMP. NOTE: THIS PROCEDURE WILL RESULT IN THE PARTIAL LOSS OF MAINTENANCE REGISTER INFORMATION. IF UNABLE TO COMPLETE THE DUMP OPERATION AFTER PERFORMING THIS PROCEDURE CONTACT A CUSTOMER ENGINEER.	Express Deadstart Dump determined during its initialization that the central processor is not accessible via the maintenance channel and this inaccessibility would cause a bad dump to be performed. Redeadstart and reselect EDD as directed. Since this procedure clears some of the error bits in the maintenance registers, some maintenance register information will be lost. If you are unable to complete the dump, inform CE.	EDD
CHANNEL ACTIVE ERROR	Channel active when it is supposed to be inactive.	CTI
CHANNEL 15 DATA TRANSFER ERROR	Data transfer error. Inform CE.	CTI
CHANNEL yy UNIT xx NOT RESPONDING	Tape unit xx on channel yy is not responding to a read request. The unit either is not ready or does not exist.	CTI
CIP COMPONENT xxxx NOT FOUND	CTI cannot find CIP component xxxx in the common disk area. Reinstall CIP. If message persists, inform CE.	CTI

Message	Description	Reporting Module
CM MISMATCH - CM SIZE AS SET BY CTI DOES NOT MATCH THAT OF DUMP TAPE - DEADSTART REQUIRED	The EDD dump tape used for the Restore CM operation was dumped with a different size of memory. The CM size must be the same to reload central memory. Change CM size via CTI to the same as when the EDD dump was taken.	RCM
CM NOT ACTIVE - LEVEL 3 REC	Memory initialization cannot be performed on a level 3 recovery.	CTI
CM RELOAD NOT FOUND ON DUMP TAPE	The EDD dump tape used for Restore CM does not have a central memory record. Use a correct EDD dump tape for restoring central memory.	RCM
CM UNAVAILABLE, (CR) TO RE-ENTER	Indicates that an address entered during a CM memory dump option is greater than the central memory size. Press the carriage return key and reenter the address.	CTI
xxxxxxx COMMAND TOO LONG	Indicates that during a tape-to-disk copy, TDX has encountered a command to be placed on disk that has more than 60 (decimal) characters. The xxxxxxx in the message is the name of the program or command buffer where the faulty command was found. Pressing the space bar allows TDX to truncate the command to 60 (decimal) characters and continue the operation.	TDX
COMMON DISK AREA FULL	Insufficient space in the CDA to perform an update build. Redeadstart using the CIP tape and initialize the CDA by selecting the Z option on the CAU Initial Options display.	CTI
CON,CSaaaa,DSbbbb FCN,CSaaaa,DSbbbb WRT,CSaaaa,DSbbbb	When attempting to generate a dump tape, a connect reject (CON), function reject (FCN), or write error (WRT) was encountered. aaaa specifies the channel converter status. bbbb specifies the controller status.	EDD

Message	Description	Reporting Module
COPY ERROR xxxxxxx	Indicates that during a copy operation, the program or command buffer xxxxxxx could not be copied successfully. Pressing the space bar allows TDX to skip to the next program or command buffer and resume copying.	TDX
CPU x NOT RESPONDING	CPU x did not respond to EI function request within 1-second time limit. Inform CE.	CTI
CTI CYLINDER OVERFLOW	Space available on the CTI cylinder was not enough to contain the entire CTI file. This problem may have been caused by disk errors. Reformatting the disk or changing packs may resolve the problem.	CTI
CTI PPxx NOT RESPONDING DEADSTART ABORTED	CTI cannot communicate with the PP selected as the alternate PP. Inform CE.	CTI
DEADSTART ABORTED - FATAL ERROR	The system detected a fatal error during confidence testing. Inform CE.	CTI
DEADSTART SECTOR ERROR	Indicates TDX was unable to read or write the deadstart sector. A deadstart is required.	TDX
DISK BUSY	Indicates that the disk general status has responded busy to 10000 (octal) attempts by TDX to perform a seek to read or write. Pressing the space bar allows TDX to continue the read or write attempt.	TDX
DISK CONTROLLER RESERVED	Indicates that the disk controller general status shows the multiple access disk controller continues to be reserved to another PP channel following 20 (decimal) attempts 20 (decimal) attempts to connect to the unit. TDX continues to display the message and attempts the connect until successful or until a deadstart is performed.	TDX, CTI

Message	Description	Reporting Module
DISK CONTROLLER TRANSFER ERROR xxxxxxx	Indicates TDX was unable to output or input the expected number of words to or from the disk controller, but that the general status indicates no errors. The xxxxxxx is the name of the program or command buffer being copied. Pressing the space bar causes TDX to retry the transfer.	TDX
DISK ERR STAT yyyy xxxxxxx	Indicates that the status received from the disk drive shows that an error condition exists. The xxxxxxx in the message is the name of the program or command buffer that TDX was working with when the error occurred, and yyyy is the octal status word. Pressing the space bar allows TDX to continue the operation, through the result may not be reliable.	TDX
DISK FUNC REJ yyyy xxxxxxx	Indicates that a function sent to the disk controller has been rejected. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and the yyyy is the octal value of the function code that was rejected. Pressing the space bar allows TDX to retry the operation.	TDX
DISK FUNCTION REJECT FUNCTION = xx	The indicated function code xx was not accepted by the disk controller. xx is the function code that was rejected. Press the carriage return key to attempt an error recovery operation.	TDX
DISK UNIT RESERVED	The general status indicates the disk unit has reserved status.	CTI
DISK READ ERROR INFORM CE	CTI was unable to access disk within a predetermined number of attempts. Inform CE.	CTI
DISK STATUS ERROR STATUS = xxxx	The general status word xxxx received from the disk indicates an error condition exists. Press the carriage return key to retry the operation.	CTI

Message	Description	Reporting Module
DISK UNIT RESERVED	Indicates that the disk general status shows that the disk remains reserved to another controller following 20 (decimal) attempts to connect to the disk. TDX continues to display the message and attempts the connect until successful or until a deadstart is performed.	TDX
DUMP DOES NOT CONTAIN FULL IMAGE OF CM. DEADSTART REQUIRED.	A CM reload was terminated because the dump used to perform the reload was dumped with either the NO MEMORY option or the CRITICAL MEMORY ONLY option.	RCM
DUMP TAPE ON CH cc EQ ee UN uu NOT READY (CR WHEN READY)	The dump tape equipment for an express deadstart dump is not ready. Ready the equipment and press **Enter** to continue.	EDD, RCM
DUMP TAPE ON CH cc EQ ee UN uu NO WRITE RING (CR WHEN READY)	The dump tape for an express deadstart dump does not contain a write ring. Insert a write ring and press **Enter** to continue.	EDD
ELEMENT NOT ACCESSIBLE VIA THE MAINTENANCE CHANNEL	Indicates that HDP is unable to access central memory, CPU, register files, or maintenance registers as required by the option.	CTI
ERROR - ADDRESS OUT OF RANGE	The system was unable to access the specified available memory during memory initialization. Press **Enter** to clear the display.	CTI
ERROR CM	The system detected an error in CM during hardware verification (HIVS). Inform CE.	HIVS
ERROR CPU xx	The system detected an error in CPU xx during hardware verification (HIVS). Inform CE.	HIVS
ERROR IN (error) FATAL TO DUMP OPERATION DUMP UNSUCCESSFUL. (CR) TO SEE STATUS.	An error occurred during an express deadstart dump operation. Press DEADSTART to retry the dump. If message reappears, inform CE.	EDD
ERROR IN (error) FATAL TO RELOAD OPERATION RELOAD UNSUCCESSFUL. (CR) TO SEE STATUS.	An error occurred during a reload from EDD tape. Press **Enter** to see the status.	RCM

Message	Description	Reporting Module
ERROR PP xx	The system detected an error in PP xx during hardware verification (HIVS). Inform CE.	HIVS
ERROR REG	The system detected an error during hardware verification (HIVS). Inform CE.	HIVS
ERRORS OCCURRED DURING CENTRAL MEMORY INITIALI-ZATION.	An error occurred during central memory initialization. Inform CE.	CTI
FLAW CYL xxxx TRK yyyy SEC zzzz	Indicates that TDX has failed in four consecutive attempts to write data to a disk sector. The values in the message are the cylinder (xxxx), track (yyyy), and the sector (zzzz), which may not be written in. Pressing the **Space bar** allows TDX to continue the copy with another sector. The bit of the flawed sector remains set in the SRT to ensure that TDX does not attempt to use the bad sector again.	TDX
FORMATTING ERROR	Indicates an error occurred while formatting the MSL area on an 895 Disk subsystem.	TDX
FUNCTION TIMEOUT, (CR) TO RETRY	Indicates that a function issued to the printer has not been accepted. Press **Enter** to retransmit the function.	HDP
GS=nnnn	Device communication error (general status). Inform CE.	I/O Driver
HARDWARE VERIFICATION IS UNAVAILABLE WITH A LEVEL 3 DEADSTART (BS) PREVIOUS DISPLAY	HIVS can only be executed on a level 2 or less recovery.	CTI
ILLEGAL BUILD SELECTION OS FILES COULD BE DESTROYED	Indicates the build option selected could cause operating system files to be destroyed because space previously allocated to the operating system is being used. Choose an installation mode that will not destroy operating system files or deadstart and release the disk space using CTI.	TDX

Message	Description	Reporting Module
ILLEGAL ENTRY	The user entered an illegal parameter during parameter entry. Press the **Space bar** to return to the parameter display and reenter the parameter.	TDX
IMPOSSIBLE TO INSTALL PROGRAMS AND SAVE COMMAND BUFFER AREA	The operator is saving a command buffer library at cylinder xxxxxxx. TDX does not examine the two succeeding cylinders to find a suitable starting cylinder. Deadstart is required.	TDX
INSTALL ABORTED DUE TO DEVICE ERROR INFORM CE (CR) TO PROCESS DIFFERENT DEVICE	Error encountered during installation. Press **Enter** to select a device or deadstart to exit.	CTI
INSTALLATION COMPLETE DEADSTART IS REQUIRED	Indicates TDX has completed a disk build for automatic CIP tape installation. Deadstart to continue.	TDX
INSUFFICIENT LOGICALLY ON PPS, DEADSTART ABORTED	Too many PPs have been logically turned off to permit a successful deadstart.	CTI
INTER-PP DATA TRANSFER ERROR	Indicates the tape or disk driver is unable to output or input the expected number of words to or from the other driver. The xxxxxxx is the name of the current program or command buffer. A deadstart is required.	TDX
INVALID CHANNEL ENTRY	An invalid channel number was entered. Press **Enter** and reenter the channel number.	CTI
INVALID ENTRY	Invalid keyin. Pressing the left blank key clears the message.	CTI
INVALID ENTRY	Indicates that a character that is not a member of an accepted character set as been entered. Enter a valid character to clear the error.	CTI
INVALID OPTION	Invalid option was selected.	CTI

Message	Description	Reporting Module
INVALID PROGRAM NUMBER	Undefined CTI module requested.	CTI
INVALID SELECTION, (CR) TO RETRY	Indicates that the start address is larger than the end address for a CM memory dump option. Press **Enter** and reenter the two addresses.	CTI
IOU1 NOT RESPONDING	CTI cannot communicate with IOU 1. Inform CE.	PAK
IPL NOT FOUND	First record was read from the deadstart device and its name was not IPL.	CTI
LEVEL 3 RECOVERY NOT POSSIBLE. CENTRAL MEMORY INITIALIZATION HAS BEEN SELECTED BY THE OPERATOR, OR AUTOMATICALLY SET BY THE HARDWARE. DEADSTART AND SELECT DIFFERENT RECOVERY LEVEL, OR DO NOT SELECT MAINFRAME INITIALIZATION.	A level 3 recovery is not possible when power on initialization is selected. On I4 IOUs, power on initialization will be set automatically by CTI following a system power up, or when the current deadstart immediately follows an MSL load. In this case, you must change the deadstart level to less than 3.	CTI
LOAD ERROR DEADSTART ABORTED	An attempt to load a module from the MSL or the CTI/MSL disk area failed. Inform CE.	CTI
LOGGING MAINTENANCE REGISTERS	Maintenance register errors and DHE is writing them to the DEL.	CTI
MAINTENANCE CHANNEL TIMEOUT (DEADSTART ABORTED) INFORM CE	Maintenance channel did not respond when an attempt was made to function or transfer data to a mainframe element. Inform CE.	CTI
MAINT. REG ERROR yyyy	The system detected an error in a maintenance register during hardware verification (HIVS). Inform CE.	HVS
MEMORY MARGINS SELECTED (CR) TO CONTINUE	CTI detected central memory margins status selected in the maintenance registers. Press **Enter** to proceed, or return switch to normal and deadstart.	CTI

Message	Description	Reporting Module
MAINFRAME RECONFIGURATION TABLE (MRT) ON DISK DOES NOT MATCH THE MAINFRAME BEING DEADSTARTED	The MRT on disk will be initialized for the current mainframe. Enter a carriage return to continue the deadstart.	CTI
MAINTENANCE NOT FOUND ON DEVICE ENTER ALTERNATE DEVICE	The deadstart file does not contain the HVS module. Enter an alternate device or install the HVS module on the same device and redeadstart.	CTI
MEMORY NOT ACCESSIBLE	A memory element is not accessible via the maintenance channel.	CTI
MEMORY UNAVAILABLE	Selected value exceeds memory. Clear message and reenter command. Operator has attempted to set the logical state of an I4 CIO RP, but none are installed.	CTI
MICROCODE INITIALIZATION ERROR (DEADSTART ABORTED) INFORM CE	Processor microcode failed to complete its initialization in the prescribed time limit. Inform CE.	CTI
MIN CONFIGURATION NOT AVAILABLE	The operator attempted to load microcode, EI, or both without the required minimum system elements. CTI also displays the count of each system element. Reconfigure hardware to at least the minimum configuration.	CTI
MODULE NOT ON LIBRARY DEADSTART ABORTED	An attempt to find a module on the MSL failed. Inform CE.	CTI
MS LOAD NOT POSSIBLE. ALTERNATE PP DISABLE IS SET, AND CENTRAL MEMORY INITIALIZATION HAS BEEN SELECTED BY THE OPERATOR, OR AUTOMATICALLY SET BY THE HARDWARE. DEADSTART AND CLEAR ALTERNATE PP DISABLE, OR DO NOT SELECT MAINFRAME INITIALIZATION.	Selection of the M option after selecting power-on initialization is only allowed when word 12 of the deadstart program directs CTI to initialize the alternate PP. Select the desired option and redeadstart.	CTI

Message	Description	Reporting Module
MSL STARTING CYLINDER UNUSABLE	Indicates that the starting cylinder and the two succeeding cylinders are unsuitable for a maintenance-only installation. A deadstart is required to reattempt the installation at another cylinder.	TDX
MSL STARTING CYLINDER UNUSABLE ENTER -CR- TO USE ALTERNATE CYLINDER yyyy OR RELOAD TDX AND SELECT A NEW CYLINDER	Indicates that the starting cylinder is unusable, although one of the two succeeding cylinders is suitable for the operation. The yyyy is the cylinder which TDX has found to be suitable. Entering a CR allows TDX to prepare cylinder yyyy for the operation. Entering any other character allows TDX to request another starting cylinder.	TDX

NOTE

If the user is saving a command buffer library at cylinder xxxx, TDX displays the message IMPOSSIBLE TO INSTALL PROGRAMS AND SAVE COMMAND BUFFER AREA and does not examine the two succeeding cylinders.

xxxxxxx NAME TOO LONG	Indicates that TDX has detected a program or command buffer name on tape that contains more than seven characters. The xxxxxxx in the message is the first seven characters of the name that is too long. Entering a space bar allows TDX to skip to the next program or command buffer and continue the operation.	TDX
NM=xxx	CTI module xxx not found.	CTI
NO CM AVAILABLE	An HIVS test is selected for which hardware is turned OFF via CTI or is physically not present.	I/O Driver
NO CP AVAILABLE	An HIVS test is selected for which hardware is turned OFF via CTI or is physically not present.	HIVS
NO PP AVAILABLE	An HIVS test is selected for which hardware is turned OFF via CTI or is physically not present.	HIVS

Message	Description	Reporting Module
xxxxxxx NO TAPE WRITE RING	Indicates that a disk-to-tape copy is being attempted and that no write ring is being detected on the tape. You may, upon seeing the NO TAPE WRITE RING message, unload and dismount the tape, insert a write ring into the tape hub, and mount and reload the tape. When you press the space bar, the tape is positioned at the beginning of tape and the copy proceeds. The xxxxxxx is the name of the program or command buffer with which TDX was working.	TDX
xxxxxxx NOT COPIED - END OF TAPE	Indicates TDX encountered the end-of-tape while writing program xxxxxxx in a disk to tape copy. TDX backspaced the tape and wrote end-of-information and file marks to the tape before displaying the message. A deadstart is required.	TDX
xxxxxxx NOT FOUND	Indicates that TDX has not been able to locate a program or command buffer for which it has been searching. The xxxxxxx in this message is the name being searched for. In the case of a tape-to-disk copy, the TDX search is initiated by a COPY FROM request. In the case of a disk-to-tape copy, the TDX search may be initiated by either a COPY FROM or COPY THRU request. For a COPY THRU request, TDX begins the search with the program entered for the COPY FROM message. Pressing the space bar returns TDX to the copy message that contains the unknown name.	TDX
OFFLINE MAINTENANCE NOT AVAILABLE	The M option was selected from the Initial Options display after deadstart from a HIVS/CIP tape.	CTI
OPERATING SYSTEM FILE NOT FOUND ON DEVICE. ENTER ALTERNATE DEVICE	The deadstart file does not contain the operating system. Enter an alternate device or install the operating system on the same device and redeadstart.	CTI

Message	Description	Reporting Module
PACKET COMMUNICATION ERROR	An error was encountered when CTI attempted to send a packet to the intelligent console.	CTI
PACKET TRANSFER ERROR TO IOU1 ERROR CODE - xx	Error Codes 1 = CHECKSUM ERROR 2 = ILLEGAL FUNCTION CODE 3 = PACKET TOO LONG 4 = DATA TRANSMISSION ERROR 7 = PP ERROR C = DATA ERROR 10 = CTRL-G EXCHANGE ABORTED 11 = NO START BYTE 12 = PACKET ERROR 13 = TIMEOUT ERROR 14 = BUSY	CTI
PAGE TABLE AREA VERIFY ERROR, (DEADSTART ABORTED) INFORM CE	A data error was detected while doing a one/zeros page check of the central memory area in which the page table is built. Inform CE.	CTI
PNT FULL xxxxxxx	Indicates that the disk PNT is full. The xxxxxxx in the message is the name of the program or command buffer that filled the PNT. A deadstart is required to clear this message.	TDX
PP HUNG, (CR) TO RETRY	Indicates that communication has been lost with the PP performing the memory dump to printer. Press the carriage return key to attempt to reestablish communication.	CTI
PP UNAVAILABLE, (CR) TO RE-ENTER	Indicates that the PP chosen for the PP memory dump option physically does not exist. Press the carriage return key and reenter the desired PP number.	CTI
PRINTER BUSY	Indicates that the printer is busy. When the condition clears, the message is erased from the display and HDP execution continues automatically.	CTI

Message	Description	Reporting Module
PRINTER NOT READY	Indicates that the printer is not ready to accept HDP output. When the condition clears, the message is erased from the display and HDP execution continues automatically.	CTI
PROCESSOR FAULT STATUS ERROR (DEADSTART ABORTED) INFORM CE	A fault status error was detected while the processor was being initialized. Inform CE.	CTI
PROCESSOR NOT ACCESSIBLE	A processor element is not accessible on the maintenance channel.	CTI
PROCESSOR NOT RESPONDING FATAL ERROR - (DEADSTART ABORTED) INFORM CE	A processor exists, but is not responding to functions on the maintenance channel. Inform CE.	CTI
PROGRAM NOT ON TAPE - mne	The program name was not found when reading the tape.	CTI
REWINDING DUMP TAPE.	Informative message which indicates that the dump tape is being rewound.	EDD, RCM
SCI NOT IN CIP BUFFER AREA	Indicates that CTI was unable to find SCI in the CIP buffer area of central memory. Ensure that SCI is installed on the Common Disk Area (CDA) of the CIP device and then attempt another deadstart.	CTI
SRT FULL xxxxxxxL	Indicates that the disk SRT has reserved the entire available area on the disk. The xxxxxxx in this message is the name of the program or command buffer that filled the disk. A deadstart is required to clear this message.	TDX
xxxxxxx TAPE ERR STAT yyyy	Indicates that the status received from the tape drive shows that an error condition exists. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and yyyy is the octal status word. Pressing the **Space bar** allows TDX to attempt to continue the operation, though the result may not be reliable.	TDX

Message	Description	Reporting Module
TAPE ON CH cc EQ ee UN uu INCORRECT LABEL FOR RELOAD MOUNT EDD TAPE (CR WHEN READY).	The tape mounted during a reload from EDD tape does not appear to be a dump tape. Mount the EDD tape, then press **Enter**.	RCM
TAPE ON CH cc EQ ee UN uu WAITING REEL rr (CR WHEN READY).	Prompts the operator to mount successive reels during a reload from EDD tape. Mount the next tape and press **Enter** to continue.	RCM
xxxxxxx TAPE FUNC REJ yyyy	Indicates that a function sent to the tape drive or data channel converter (60X or 65X) has not been accepted. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and the yyyy is the octal value of the function code that was rejected. TDX tries the operation three times (including timeouts) before displaying the message. Press the **Space bar** to allow TDX to retry the operation.	TDX
TAPE ON UNIT XX NOT RECOGNIZED (CR) TO CONTINUE	The tape mounted on unit XX does not contain an IDC record which CTI recognizes. Press the **Enter** key to return to the UTILITIES display. If another install option is selected, mount a different tape on unit XX, or select a different tape unit.	CTI
TAPE STATUS ERROR STATUS = xxxx	The general status word xxxx received from the tape indicates an error condition exists. Press **Enter** to retry.	CTI
TPM FUNCTION TIMEOUT	The TPM function timed out.	PAK
xxxxxxx TAPE UNIT NOT READY	Indicates that the status received from the tape drive shows that the unit is not ready. The xxxxxxx is the name of the program or command buffer with which TDX was working. Correct the not ready condition without moving the tape and press the **Space bar** to continue.	TDX

Message	Description	Reporting Module
UNABLE TO ACCESS CPU VIA MAINTENANCE CHANNEL. ENTER (CR) TO CONTINUE, OR DEADSTART AND INFORM CE.	CTI was unable to access any CPU during initialization for printer dumps via HDP. Press **Enter** to perform PP or IOU register dumps only, or inform CE.	CTI
UNABLE TO ACCESS DISK (CR) TO PROCESS DIFFERENT DEVICE	Not able to access specified device. Press **Enter** to select a different device or deadstart to exit.	CTI
UNABLE TO ACCESS TAPE (CR) TO PROCESS DIFFERENT DEVICE	Not able to access specified device. Press **Enter** to select a different device or deadstart to exit.	CTI
UNABLE TO EXECUTE COMMON DISK AREA REQUEST. CDA HAS NOT BEEN INITIALIZED. DEADSTART REQUIRED.	With the release of CIP V006, an initial install is required before any CDA utility can be executed. Subsequent CIP releases do not require this initial build.	CTI
UNABLE TO EXECUTE COMMON DISK AREA REQUEST. CDA HAS NOT BEEN INITIALIZED. (CR) FOR OPTION DISPLAY	With the release of CIP V006, an initial install is required before any CDA utility can be executed. Subsequent CIP releases do not require this initial build.	CTI
UNABLE TO INSTALL CIP READ ONLY SWITCH ACTIVE	An attempt to install CTI to an FMD disk drive, CTI found the read-only switch depressed. Toggle the read-only switch.	CTI
UNABLE TO LOAD MDD. THE INTEGRITY OF CENTRAL MEMORY HAS BEEN COMPROMISED.	MDD checksum failed.	CTI
UNABLE TO PERFORM -UPDATE- INSTALL. COMMON DISK AREA NOT INITIALIZED. DEADSTART AND SELECT AN -INITIAL- CIP INSTALLATION.	With the release of CIP V006, an initial install is required before any other build can be executed. Subsequent CIP releases do not require this initial build.	CTI
UNAVAILABLE	Operator has attempted to set the logical state of an I4 CIO PP, but none are installed.	CTI
UNUSABLE DISK	Indicates that the default starting cylinder for a HIVS installation is faulty. The operator must deadstart and perform the installation to a different device.	TDX

Message	Description	Reporting Module
VERIFY CM DATA ERROR	Indicates CTI encountered errors when verifying EI data written to central memory. Inform CE.	CTI
VSN=vvvvvv FILE NOT EXPIRED.	The HDR 1 label of the tape contains an expiration date greater than the current day's date, as indicated by either the calendar/clock chip or operator input. An unlabeled or expired tape must be used.	EDD
WRITING MEMORY	Each available word of central memory is written with two patterns, checking for errors on each pass. The duration of the message is a function of central memory size.	CTI

Field Change Announcement (FCA) Interpretation C

The purpose of the FCA chart is to communicate the levels of maintenance software, hardware, CIP, and operating system software (system elements) that have been tested and certified by Control Data to function correctly together. Each computer system model has its own FCA.

Each mainframe's FCA indicates the baseline components for the machine; that is, the system element levels for the machine at first field availability. The FCA index at that time is 1. A change in one of the system elements is reflected as a new line on the FCA. Only when the change requires a change to another system element or when microcode is changed is the FCA index incremented.

The chart presents the information in grid format, which allows for little verbal explanation. Short comments are provided on the form. Additional information is provided on the ARIES system, which is accessible by the CE.

Figure C-1 shows a sample FCA chart and includes abbreviated definitions of the chart entries.

Control Data certifies that the hardware at the current FCO level works with the current levels of maintenance software, the current level of the CIP, and current level of operating systems. Control Data also ensures that operating systems released within the last 12 months will work with the current hardware level. The levels of hardware and software that are certified to work together are commonly referred to as plug and play levels.

If you have questions regarding a particular combination of system components, contact Arden Hills Field Support [Controlnet 235-3074, 800-328-9567, or (612) 482-3074] for help.

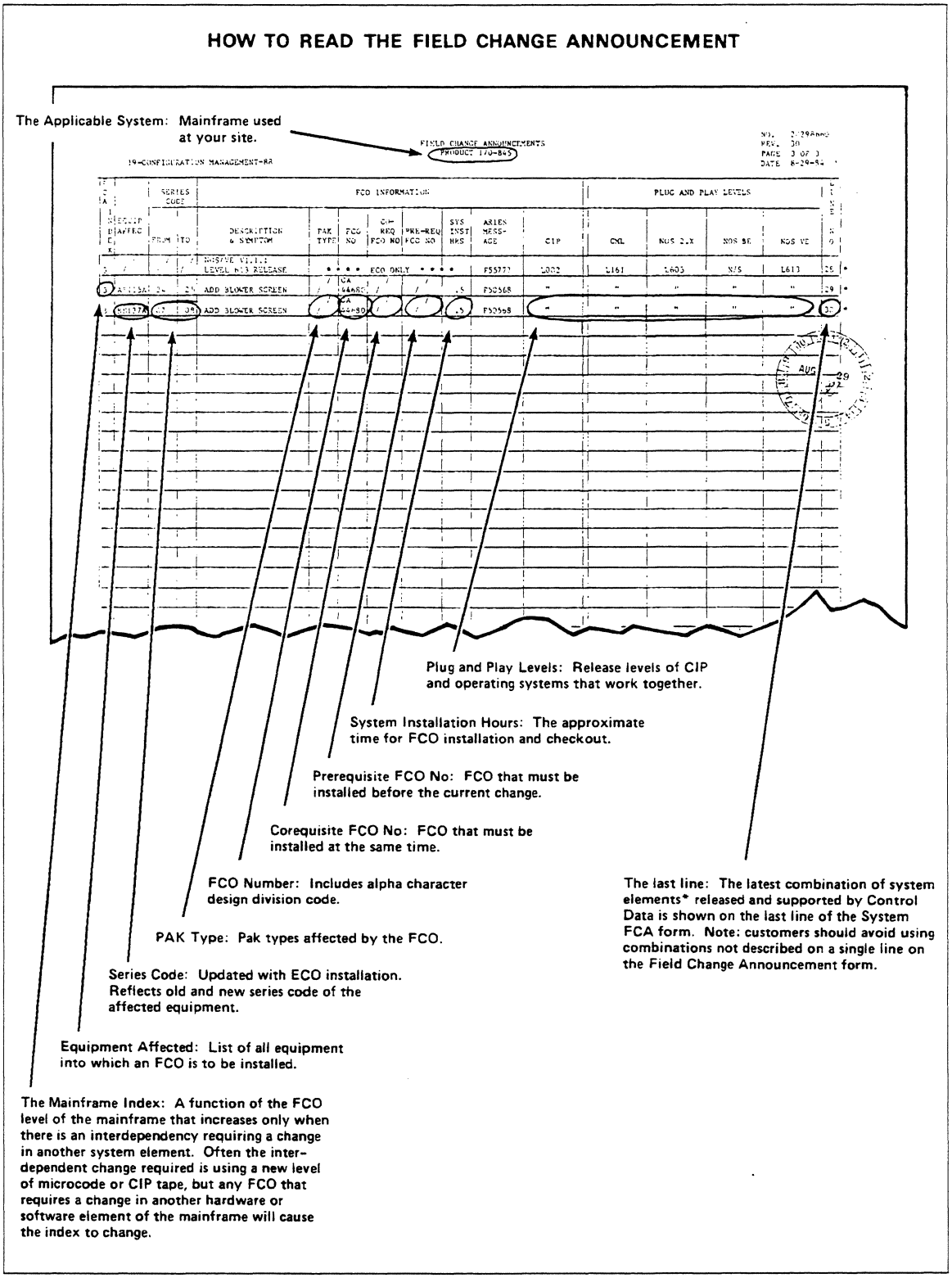
HOW TO READ THE FIELD CHANGE ANNOUNCEMENT
The Applicable System: Mainframe used at your site.
FIELD CHANGE ANNOUNCEMENTS
PRODUCT 170-845
19-CONFIGURATION MANAGEMENT-RR
SERIES CODE
FCO INFORMATION
PLUG AND PLAY LEVELS
DESCRIPTION & SYMPTOM
PAK TYPE
FCO NO
PRE-REQ FCO NO
SYS INST HRS
CIP
CNL
NOS 2.X
NOS BE
NOS VE
LEVEL 613 RELEASE
ECO ONLY
ADD BLOWER SCREEN
Plug and Play Levels: Release levels of CIP and operating systems that work together.
System Installation Hours: The approximate time for FCO installation and checkout.
Prerequisite FCO No: FCO that must be installed before the current change.
Corequisite FCO No: FCO that must be installed at the same time.
FCO Number: Includes alpha character design division code.
PAK Type: Pak types affected by the FCO.
Series Code: Updated with ECO installation. Reflects old and new series code of the affected equipment.
Equipment Affected: List of all equipment into which an FCO is to be installed.
The Mainframe Index: A function of the FCO level of the mainframe that increases only when there is an interdependency requiring a change in another system element. Often the inter-dependent change required is using a new level of microcode or CIP tape, but any FCO that requires a change in another hardware or software element of the mainframe will cause the index to change.
The last line: The latest combination of system elements* released and supported by Control Data is shown on the last line of the System FCA form. Note: customers should avoid using combinations not described on a single line on the Field Change Announcement form.

Figure C-1. How to Read the FCA Chart

Problem Reporting D

The CIP contains hardware and software components. Hardware problems are reported differently than software problems: The TAR is the primary mechanism for reporting hardware problems; the PSR is the primary mechanism for reporting software problems. Eventually, one form will be used to report both types of problems. Until that time, report problems as you currently do:

- If a hardware problem occurs, write a TAR.
- If a software problem occurs (either maintenance software, console software, deadstart-time software, or operating system software), write a PSR.

NOTE

When reporting a console software problem, be sure to include the associated Fault Symptom code. Also, if you have a console printer, and if the problem you are experiencing is related to a console display(s), it is very helpful to have a printout of the problem (via the print screen function).

When CIP problems are fixed, the release vehicle of the solution is a new CIP release.

Hardware Initialization Verification Software (HIVS) Tests E

The following tests, listed in alphanumeric order, are associated with the HIVS. Each test is briefly described.

CMC - CENTRAL MEMORY CONFLICT PROGRAM

CMC compares one 12-bit word at a time with a known pattern until five words are checked. Those that do not compare produce an error message.

CT8 - RANDOM INSTRUCTION TEST WITH SIMULATION

CT8 tests random instructions by generating random numbers to determine what values are used.

EJP - GO/NO GO EXCHANGE JUMP TEST

EJP is a go/no go test of the exchange hardware normally executed by HIVS. The test runs in any selected area of CM.

MY1 - 65K AND 131K CENTRAL MEMORY TEST

MY1 performs data-only checks of central memory (65K and 131K). MY1 halts at address RA+132.

PCX - PPU COMMAND TEST

PCX tests all instructions (other than I/O) in the PPs of the system. Each PP is checked using 100 instructions.

Comments (continued from other side)

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Who are you?

- ☐ Manager
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- ☐ Applications programmer
- ☐ Operator
- ☐ Other _____

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- ☐ To learn the product or system
- ☐ For comprehensive reference
- ☐ For quick look-up
- ☐ Other _____

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_____

How do you like this manual? Answer the questions that apply.

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☐	☐	☐	Is it easy to understand?
☐	☐	☐	Is the order of topics logical?
☐	☐	☐	Can you easily find what you want?
☐	☐	☐	Are there enough examples?
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☐	☐	☐	Do the illustrations help you?
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Comments? If applicable, note page and paragraph. Use other side if needed.

Check here if you want a reply: ☐

Name _____ Company _____

Address _____ Date _____

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Please send program listing and output if applicable to your comment.